Installation Manual

RES-12XR3-S

for X8DTL-6/-6F

1RU 19” Rack-Mount Rugged Enterprise Server
with X8DTL-6 and X8DTL-6F Motherboard Configuration
/ Two Quad-Core 5500 or Quad/Six-Core 5600 Xeon CPUs

RES-12XR3-S for X8DTL-6/6F

Two Quad-Core 5500 or Quad/Six-Core 5600 Xeon CPUs

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Version 1.0—September 2010

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This product complies with the European EMC Directive (2004/108/EC) and the European Low Voltage Safety Directive (2006/95/EC)/.

Safety Precautions

Instructions regarding safety precautions during installation, operation, or maintenance of the equipment are given in the section entitled “Safety Instructions” on page iv.

WARNINGS and CAUTIONS

The definitions of WARNINGS and CAUTIONS as used in this document are given in the Preface in the section entitled “Notes, Cautions, Warnings, and Sidebars”.

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Safety Instructions

To maximize user safety and ensure correct device operation, all instructions contained in this section should be read carefully.

Caution: It is important that the user observe all warnings and instructions that are on the device and contained in this manual.

- The device must be used in accordance with the instructions for use.
- Electrical installations in the room must correspond to the requirements of respective regulations.
- Take care that there are no cables, particularly mains cables, in areas where persons can trip over them.
- Do not use a mains connection in sockets shared by a number of other power consumers. Do not use an extension cable.
- Only use the mains cable supplied.
- The unit is completely disconnected from the power source only when all power cords are disconnected from the power sources. Therefore the power cords and their connectors must always remain easily accessible.
- Do not set up the device in the proximity of heat sources or in a damp location. Make sure the device has adequate ventilation.
- All connection cables must be screwed or locked to the chassis housing.
- The device is designed to be used in horizontal position only.
- The device is no longer safe to operate when

  — the device has visible damage or

  — the device no longer functions.
- In these cases, the device must be shut down and secured against unintentional operation.
- Repairs may only be carried out by a person authorized by Themis Computer.
- The device may only be opened for the installation and removal of extension (PCI) cards, memory modules, hard-disk/solid-state drives, fan housings,

power supplies, and the lithium battery—all in accordance with the instructions given in this manual.

- If extensions are made to the device, the legal stipulations and the device specifications must be observed.
- The device must be switched off when removing the top cover; for example, before installing extension (PCI) cards.

Operation of Laser Source Devices

DVD/CD-ROM drives contain laser light-emitting diodes (classified in accordance with IEC 825-1:1993: LASER CLASS 1) and, therefore, must not be opened.

If the enclosure of such a drive is opened, invisible laser radiation is emitted. Do not allow yourself to be exposed to this radiation.

The laser system meets the code of Federal Regulations 21 CFR,1040 for the USA and Canadian Radiation Emitting Devices Act, REDR C 1370.

Electrostatic Discharge (ESD)

A sudden discharge of electrostatic electricity can destroy static-sensitive devices or micro-circuitry. Proper packaging and grounding techniques are necessary precautions to prevent damage. Always take the following precautions:

1. Transport boards in static-safe containers such as boxes or bags.
2. Keep electrostatic-sensitive parts in their containers until they arrive at static-free stations.
3. Always be properly grounded when touching a sensitive board, component, or assembly.
4. Store electrostatic-sensitive boards in protective packaging or on conductive foam.

Grounding Methods

Guard against electrostatic damage at workstations by following these steps:

1. Cover workstations with approved anti-static material. Provide a wrist strap connected to a work surface and properly grounded tools and equipment.

2. Use anti-static mats, heel straps, or air ionizers to give added protection.
3. Handle electrostatic-sensitive components, boards, and assemblies by the case or the PCB edge.
4. Avoid contact with pins, leads, or circuitry.
5. Turn off power and input signals before inserting and removing connectors or test equipment.
6. Keep the work area free of non-conductive materials such as ordinary plastic assembly aids and Styrofoam.
7. Use field service tools, such as cutters, screwdrivers, and vacuums that are conductive.
8. Always place drives and boards PCB-assembly-side down on the foam.

Instructions for the Lithium Battery

Systems are equipped with a lithium battery installed on the motherboard. To replace this battery, please observe the instructions that are described in this manual.

Warning: There is a danger of explosion when the wrong type of battery is used as a replacement.

Table of Contents

. **Preface** xvii

1. **Overview and Specifications** 1-1

1.1 Overview 1-1

1.2 System LEDs and I/O Connectors 1-4

1.3 Chipset Overview 1-9
  1.3.1 Main Features of the 5500 Series Processor and the 5500 Chipset 1-10

1.4 Special Features 1-10
  1.4.1 Recovery from AC Power Loss 1-10

1.5 PC Health Monitoring 1-11
  1.5.1 Fan Status Monitor with Firmware Control 1-11
  1.5.2 Environmental Temperature Control 1-11
  1.5.3 System Resource Alert 1-12

1.6 ACPI Features 1-12
  1.6.1 Slow Blinking LED for Suspend-State Indicator 1-12
  1.6.2 Main Switch Override Mechanism 1-12
  1.6.3 Wake-on-LAN (WOL) 1-13

1.7 Super I/O 1-13

1.8 Overview of the Winbond WPCM450R Controller 1-13

1.9 Specifications 1-14
  1.9.1 General 1-14
  1.9.2 Electrical 1-15
    1.9.2.1 System Power 1-16
    1.9.2.2 Output Voltage 1-16
  1.9.3 Environmental 1-16
    1.9.3.1 Shock 1-16
    1.9.3.2 Electrostatic Discharge 1-16
    1.9.3.3 Noise 1-16

1.10 Packaging and Shipping 1-19
  1.10.1 Accessory Kit 1-19
  1.10.2 Rack-Mount Slides (Optional) 1-20

2. Installation and Operation 2-1

2.1 Installation Procedures 2-1
  2.1.1 Remove Protective Top Cover 2-1
  2.1.2 Memory Modules 2-3
    2.1.2.1 Installation 2-5
  2.1.3 PCI Cards 2-8
  2.1.4 Lithium Battery 2-8
    2.1.4.1 Removing the Lithium Battery 2-8
    2.1.4.2 Installing a Lithium Battery 2-9
  2.1.5 SAS/SATA Storage Drive 2-9
    2.1.5.1 Opening the RES-12XR3-S for X8DTL-6/-6F Front Doors 2-9
    2.1.5.2 storage-Drive Removal 2-10
    2.1.5.3 Storage-Drive Installation 2-12
  2.1.6 Hot-Swappable 38-mm Fan 2-13
    2.1.6.1 Removing and Installing a 38-mm Fan 2-13
  2.1.7 Power Supply 2-15
    2.1.7.1 Removing a Power Supply 2-15
    2.1.7.2 Installing a Power Supply 2-16

2.2 Rack Mounts 2-16
  2.2.1 Mounting Brackets 2-16
  2.2.2 Rack-Mount Slides (Optional) 2-17

2.3 Operation 2-17
  2.3.1 Plugging in the AC Power Cords 2-17
  2.3.2 Turning the System On 2-17
  2.3.3 Getting Started 2-18
    2.3.3.1 Configuration 2-18
    2.3.3.2 Linux Installation 2-18
  2.3.4 Turning the System Off 2-19

3. BIOS Setup Utility 3-1

3.1 Introduction 3-1
  3.1.1 Starting BIOS Setup Utility 3-1
  3.1.2 How To Change the Configuration Data 3-2
  3.1.3 Starting the Setup Utility 3-2

3.2 Main Setup 3-3
  3.2.1 System Time/System Date 3-3
  3.2.2 Supermicro X8DTL-6 Motherboard 3-4

3.2.3 Processor 3-4
3.2.4 System Memory 3-4
3.3 Advanced Setup Configurations 3-5
3.3.1 Boot Features 3-5
3.3.1.1 Quick Boot 3-5
3.3.1.2 Quiet Boot 3-5
3.3.1.3 AddOn ROM Display Mode 3-6
3.3.1.4 Bootup Num-Lock 3-6
3.3.1.5 PS/2 Mouse Support 3-6
3.3.1.6 Wait For 'F1' If Error 3-6
3.3.1.7 Hit 'Del' Message Display 3-6
3.3.1.8 Watch Dog Function 3-6
3.3.1.9 Power Button Function 3-6
3.3.1.10 Restore on AC Power Loss 3-6
3.3.1.11 Interrupt 19 Capture 3-7
3.3.2 Processor and Clock Options 3-7
3.3.2.1 CPU Ratio 3-7
3.3.2.2 Ratio CMOS Setting (Available when the item-CPU Ratio is set to Manual) 3-7
3.3.2.3 Clock Spread Spectrum 3-7
3.3.2.4 Hardware Prefetcher (Available when supported by the CPU) .. 3-7
3.3.2.5 Adjacent Cache Line Prefetch (Available when supported by the CPU) 3-8
3.3.2.6 MPS and ACPI Ordering 3-8
3.3.2.7 Intel® Virtualization Technology (Available when supported by the CPU) 3-8
3.3.2.8 Execute-Disable Bit Capability (Available when supported by the OS and the CPU) 3-8
3.3.2.9 Simultaneous Multi-Threading (Available when supported by the CPU) 3-9
3.3.2.10 Active Processor Cores 3-9
3.3.2.11 Intel® EIST Technology 3-9
3.3.2.12 Intel® TurboBoost Technology (Available when EIST Technology is enabled) 3-9
3.3.2.13 C1E Support 3-9
3.3.2.14 Intel® C-STATE Tech 3-9
3.3.2.15 C-State Package Limit Setting (Available when Intel® C-State Tech is enabled) 3-9

3.3.2.16 C1 Auto Demotion
(Available when the C-State Tech is enabled) 3-10
3.3.2.17 C3 Auto Demotion
(Available when the C-State Tech is enabled) 3-10
3.3.2.18 ACPI T State 3-10
3.3.2.19 DCA Technology 3-10
3.3.2.20 DCA Prefetch Delay 3-10
3.3.3 Advanced Chipset Control 3-10
3.3.3.1 QPI Links Speed 3-11
3.3.3.2 QPI Frequency (Available when QPI Links Speed
is set to Full Speed) 3-11
3.3.3.3 QPI L0s and L1 3-11
3.3.3.4 Memory Frequency 3-11
3.3.3.5 Memory Mode 3-11
3.3.3.6 Demand Scrubbing 3-11
3.3.3.7 Patrol Scrubbing 3-12
3.3.3.8 Channel Interleave/Bank Interleave 3-12
3.3.3.9 Throttling - Closed Loop / Throttling - Open Loop 3-12
3.3.3.10 Intel VT-d 3-13
3.3.3.11 SR-IOV Support 3-13
3.3.3.12 NUMA Support 3-13
3.3.3.13 Intel I/OAT 3-13
3.3.3.14 Active State Power Management 3-14
3.3.3.15 USB Functions 3-14
3.3.3.16 USB 2.0 Controller 3-14
3.3.3.17 Legacy USB Support 3-14
3.3.4 IDE/SATA Configuration 3-14
3.3.4.1 SATA#1 Configuration 3-14
3.3.4.2 IDE Detect Timeout (sec) 3-15
3.3.4.3 Primary IDE Master/Slave, Secondary IDE Master/Slave,
Third IDE Master, and Fourth IDE Master 3-15
3.3.5 PCI/PnP Configuration 3-17
3.3.5.1 Clear NVRAM 3-17
3.3.5.2 Plug & Play OS 3-18
3.3.5.3 PCI Latency Timer 3-18
3.3.5.4 PCI IDE BusMaster 3-18
3.3.5.5 PCI-Express I/O Performance 3-18
3.3.5.6 ROM Scan Ordering 3-18

3.3.5.7 Slot 1 PCI 33MHz, Slot 2 PCI 33MHz, Slot 3 PCIE x4 1.0 in X8 Slot, Slot 4 PCIE 2.0 x4 in x8 Slot, Slot 5 PCIE x4 in x8 Slot, Slot 6 PCIE x8 in x16 Slot 3-18
3.3.5.8 Onboard LAN Option ROM Select 3-19
3.3.5.9 Load Onboard LAN1 Option ROM/Load Onboard LAN2 Option ROM 3-19
3.3.5.10 Load Onboard SAS Option ROM 3-19
3.3.5.11 Boot Graphics Adapter Priority 3-19
3.3.6 Super IO Device Configuration 3-19
3.3.6.1 Serial Port1 Address/Serial Port2 Address 3-19
3.3.7 Remote Access Configuration 3-20
3.3.7.1 Remote Access 3-20
3.3.7.2 Serial Port Number 3-20
3.3.7.3 Serial Port Mode 3-20
3.3.7.4 Flow Control 3-20
3.3.7.5 Redirection After BIOS POST 3-20
3.3.7.6 Terminal Type 3-21
3.3.7.7 VT-UTF8 Combo Key Support 3-21
3.3.7.8 Sredir Memory Display Delay 3-21
3.3.8 Hardware Health Monitor 3-21
3.3.8.1 CPU Overheat Alarm 3-21
3.3.8.2 CPU 1 Temperature/CPU 2 Temperature/System Temperature 3-22
3.3.8.3 Voltage Readings 3-24
3.3.9 ACPI Configuration 3-24
3.3.9.1 High Performance Event Timer 3-24
3.3.9.2 PS2 KB/MS Wake Up 3-24
3.3.9.3 ACPI Aware O/S 3-24
3.3.9.4 ACPI APIC Support 3-24
3.3.9.5 APIC ACPI SCI IRQ 3-25
3.3.9.6 Headless Mode 3-25
3.3.9.7 ACPI Version Features 3-25
3.3.10 Trusted Computing 3-25
3.3.10.1 TCG/TPM (Trusted Platform Module) Support 3-25
3.3.11 IPMI Configuration 3-26
3.3.11.1 IPMI Firmware Revision 3-26
3.3.11.2 Status of BMC 3-26
3.3.12 View BMC System Event Log 3-26
3.3.12.1 Clear BMC System Event Log 3-27

3.3.13 Set LAN Configuration 3-27
  3.3.13.1 Channel Number 3-27
  3.3.13.2 Channel Number Status 3-27
3.3.14 IP Address Source 3-28
3.3.15 Event Log Configuration 3-29
  3.3.15.1 View Event Log 3-29
  3.3.15.2 Mark all events as read 3-29
  3.3.15.3 Clear event log 3-29
  3.3.15.4 PCIE Error Log 3-29
3.4 Security Settings 3-30
3.4.1 Supervisor Password 3-30
3.4.2 User Password 3-30
3.4.3 Change Supervisor Password 3-30
3.4.4 User Access Level (Available when Supervisor Password is set as above) 3-31
3.4.5 Change User Password (Available when a User Password is installed) .. 3-31
3.4.6 Clear User Password (Available only when User Password is installed) 3-31
3.4.7 Password Check (Available when a password is installed) 3-31
3.4.8 Boot Sector Virus Protection 3-31
3.5 Boot Configuration 3-32
3.5.1 Boot Device Priority 3-32
3.5.2 Storage Drives 3-32
3.5.3 Removable Drives 3-33
3.5.4 CD/DVD Drives 3-33
3.5.5 Retry Boot Devices 3-33
3.6 Exit Options 3-34
3.6.1 Save Changes and Exit 3-34
3.6.2 Discard Changes and Exit 3-34
3.6.3 Discard Changes 3-35
3.6.4 Load Optimal Defaults 3-35
3.6.5 Load Fail-Safe Defaults 3-35
3.7 BIOS Recovery 3-35
3.7.1 Boot Sector Recovery from a USB Device 3-36
3.7.2 Boot Sector Recovery from an IDE CD-ROM 3-36
3.7.3 Boot Sector Recovery from a Serial Port (“Serial Flash”) 3-36
  3.7.3.1 Requirements 3-36

3.8 BIOS Error Beep Codes 3-40

Appendix A. Connector Pinouts A-1

A.1 PS/2 Keyboard and Mouse A-1

A.2 USB Ports A-2

A.3 Serial Port A-2

A.4 VGA Display Port A-3

A.5 Gigabit Ethernet LAN Ports A-4

A.6 IPMI Dedicated LAN Port (X8DTL-6F Only) A-4

Appendix B. Rack-Mount Slide Installation B-1

Appendix C. Red Hat Enterprise Linux 5 Installation C-1

C.1 Introduction C-1

C.2 Installation C-2

Appendix D. Optional Remote On/Off Switch D-1

D.1 Remote On/Off Configuration D-1

D.2 Remote On-Only Configuration D-2

D.3 Ordering the Remote On/Off Switch D-2

Appendix E. Re-Packing Instructions E-1

E.1 Re-Packaging for Shipment E-1

E.2 Packing Components E-1

E.3 Instructions for Re-Packing E-2

List of Figures

Figure 1 Rugged Enterprise Server Model RES-12XR3-S for X8DTL-6/-6F............. xvii

Figure 1-1 RES-12XR3-S for X8DTL-6/-6F 1-1

Figure 1-2 X8DTL-6 Motherboard Block Diagram 1-3

Figure 1-3 External Features of RES-12XR3-S for X8DTL-6/6F (Front and Rear)........ 1-4

Figure 1-4 Major Components of RES-12XR3-S for X8DTL-6/-6F (Open Top View)... 1-6

Figure 1-5 RES-12XR3-S for X8DTL-6/-6F System LEDs and I/O Connectors............ 1-7

Figure 1-6 RES-22XR3 with Front Sound Baffle Installed (Front View) 1-17

Figure 1-7 RES-22XR3 with Rear Sound Baffle Installed (Rear View)......................... 1-18

Figure 2-1 Remove the RES-12XR3-S Protective Access Cover 2-2

Figure 2-2 Remove RES-12XR3-S for X8DTL-6/-6F Air-Flow Deflector 2-5

Figure 2-3 Memory Module Slot Locations 2-6

Figure 2-4 Memory Module Removal 2-7

Figure 2-5 The RES-12XR3-S for X8DTL-6/-6F Lithium Battery 2-8

Figure 2-6 The RES-12XR3-S for X8DTL-6/-6F Lithium Battery and Socket................ 2-9

Figure 2-7 Opening the RES-12XR3-S Front Doors.. 2-10

Figure 2-8 Unlocking the RES-12XR3-S Storage Drives (Front Doors Removed)........ 2-10

Figure 2-9 RES-12XR3-S Storage Drive Removal 2-12

Figure 2-10 The RES-12XR3-S for X8DTL-6/-6F Hot-Swappable 38-mm Fans 2-14

Figure 2-11 Removing One of the Five RES-12XR3-S 38-mm Fans.............................. 2-14

Figure 2-12 The RES-12XR3-S for X8DTL-6/-6F Power Supply Locking Mechanism.. 2-15

Figure 2-13 Right Rack-Mount Bracket 2-16

Figure 2-14 AC Power Socket and LED on the RES-12XR3-S for X8DTL-6/-6F Rear.. 2-17

Figure 2-15 System Power Button and LED on the RES-12XR3-S for X8DTL-6/-6F Front 2-18

Figure 3-1 Main BIOS Setup Screen 3-3

Figure 3-2 Advanced Settings 3-5

Figure 3-3 Security Settings 3-30

Figure 3-4 Boot Settings 3-32
Figure 3-5 Exit Options 3-34
Figure 3-6 AMI_FLSH HyperTerminal 3-38
Figure 3-7 ROM File Extraction 3-39
Figure 3-8 Flash Recovery 3-39
Figure A-1 USB Connector Pinout A-2
Figure A-2 COM 1 Serial Connector Pinout A-2
Figure A-3 RES-12XR3-S VGA Connector Pinout A-3
Figure A-4 Ethernet Connector, Type RJ45 .... A-4
Figure B-1 Screw Locations for Rack-Mount Slides B-1
Figure B-2 RES-12XR3-S for X8DTL-6/-6F Rack-Mount Slide Installation B-3
Figure C-1 Power On after Linux DVD is Inserted into Drive C-2
Figure C-2 Skip Key C-2
Figure C-3 Welcome Screen C-3
Figure C-4 Language Selection C-3
Figure C-5 Selecting Layout Type C-4
Figure C-6 Enter Installation Number C-4
Figure C-7 Partitioning C-5
Figure C-8 Reviewing Option C-6
Figure C-9 Creating a Custom Layout C-7
Figure C-10 Setting Up Boot Loader C-8
Figure C-11 Master Boot Record (MBR) C-9
Figure C-12 Network Devices List C-10
Figure C-13 Edit Interface Pop-Up Screen C-11
Figure C-14 Selecting Time Zone C-12
Figure C-15 Setting Up Root Account and Password C-13
Figure C-16 Package Installation Default Screen C-14
Figure C-17 Optional Packages C-15
Figure C-18 Option to Review or Continue C-16

Figure C-19 Installation Begins C-16
Figure C-20 Installation is Complete C-17
Figure C-21 Login Screen C-18
Figure C-22 Ready to use the Desktop.. C-18
Figure D-1 Remote On/Off Switch Module D-1
Figure E-1 Packaging Components.. E-2
Figure E-2 Order of Assembly E-3

List of Tables

Table 1 RES-x2XR3 20" Chassis Manual Matrix (AC and DC Power Supplies)..... xviii
Table 2 RES-x2XR3S / RES-x1XR3 17" Chassis Manual Matrix (AC and DC Power Supplies) xix
Table 3 RES-x2XR3/FIO 16" Chassis Manual Matrix (AC and DC Power Supplies) . xx
Table 1-1 RES-12XR3-S for X8DTL-6/-6F Motherboard Options 1-2
Table 1-2 RES-12XR3-S for X8DTL-6/6F Major Features 1-2
Table 1-3 System LEDs 1-8
Table 1-4 I/O Connectors... 1-9
Table 1-5 RES-12XR3-S for X8DTL-6/6F General Specifications 1-14
Table 1-6 RES-12XR3-S for X8DTL-6/6F Electrical Specifications.......................... 1-15
Table 1-7 Approximate Weights of the RES Series.. 1-21
Table 2-1 RES-12XR3-S Memory Capacity.. 2-3
Table 2-2 Memory Population for One CPU (CPU1) Installed....................................... 2-3
Table 2-3 Memory Population for One CPU (CPU2) Installed....................................... 2-3
Table 2-4 Memory Population for 2CPUs Installed.. 2-4
Table A-1 PS/2 Keyboard/Mouse Pinout and Signal Descriptions A-1
Table A-2 USB Connector Pinout Signal Descriptions A-2
Table A-3 COM 1 Serial Connector Pinout Signal Descriptions A-2
Table A-4 RES-12XR3-S VGA Connector Pinout Signals A-3

Table A-5 RJ45 Ethernet Pinout Signals A-4

Preface

This document, entitled RES-12XR3-S for X8DTL-6/-6F *Installation Manual*, provides instructions on how to install, configure, power up, and boot the Themis Rugged Enterprise Server RES-12XR3-S for X8DTL-6/-6F (see *Figure 1*). Based on two 64-bit Quad-Core 5500-Series or Quad/Six-Core 5600-Series Xeon® CPUs with a QPI (QuickPath Interconnect) up to 6.4 GT/s each, the RES-12XR3-S for X8DTL-6/-6F supports up to 48-GB 1333/1066/800-MHz DDR3 ECC-Registered memory modules.

The RES-12XR3-S for X8DTL-6/-6F supports the SuperMicro **X8DTL-6** and **X8DTL-6F** motherboards in a 17” chassis (for a matrix describing 17” chassis configurations, see *Table 2*, page xix; a matrix describing 20” chassis configurations is given in *Table 1*, page xviii;a matrix describing 16” Front I/O chassis configurations is give in *Table 3* on page -xx).

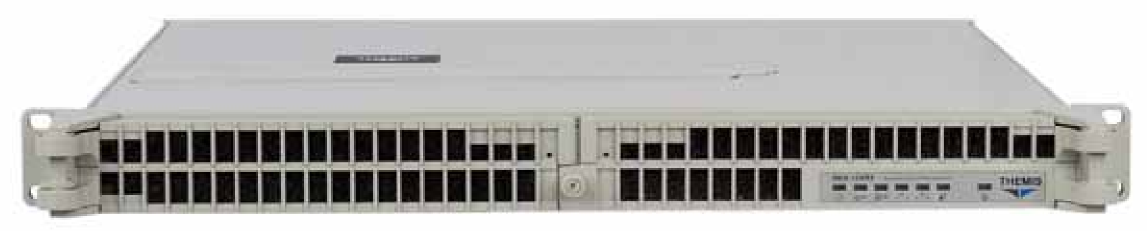

Figure 1. Rugged Enterprise Server Model RES-12XR3-S for X8DTL-6/-6F

Table 1. RES-*x*2XR3 20” Chassis Manual Matrix (AC and DC Power Supplies)

Manual	Motherboard	RES-32XR3 Manual Part Number	RES-22XR3 Manual Part Number	RES-12XR3 Manual Part Number
Configuration 1	X8DTH-iF X8DTH-6F	**116790-024**	**1176789-024**	
Configuration 2	X8DTi X8DTi-F X8DTi-LN4F	**117022-024**	**117017-024**	
Configuration 3	X8DT3 X8DT3-F X8DT3-LN4F	**117023-024**	**117018-024**	
Configuration 4	X8DTN+	**117024-024**	**117019-024**	
Configuration 5	X8DAi X8DA3	**117025-024**	**117020-024**	
Configuration 6*	X8DAH+-F	**117026-024**	**117021-024**	
Configuration 7	X8DTU-F		**117280-024**	**116970-024**

Naming Key: X8D*vwxyz*

- System RES-*x*2XR3, where *x* = 3, 2, or 1

v: A = Sound chip; no graphics chip
T = Graphics chip; no sound chip
*Configuration 6 motherboard X8DAH+-F supports both audio and video; however, the naming key does not contain a “T” in the title.

w: H = Two Tylersburg Northbridge chips
blank = One Tylersburg Northbridge chip
U = Motherboard with cutout

x: i = SATA only
3 = SAS 1.0
6 = SAS 2.0

y: LN4 = Extra gigabit Ethernet controller for two extra ports

z: F = IPMI
blank = No IPMI

Table 2. RES-*x*2XR3S / RES-*x*1XR3 17” Chassis Manual Matrix (AC and DC Power Supplies)

Mother-board	**CPU Soc kets**	**RES-32XR3S Manual P/N**	**RES-22XR3S Manual P/N**	**RES-12XR3S Manual P/N**	**RES-31XR3 Manual P/N**	**RES-21XR3 Manual P/N**	**RES-11XR3 Manual P/N**
X8DTL-6F X8DTL-6	**2**	**117408-024**	**117412-024**	**117416-024**			
X8DTL-3F X8DTL-3	**2**	**117409-024**	**117413-024**	**117417-024**			
X8DTL-iF X8DTL-i	**2**	**117410-024**	**117414-024**	**117418-024**			
X8DAL-3 X8DAL-i	**2**	**117411-024**	**117415-024**	**117419-024**			
X8SAX	**1**				**117420-024**	**117421-024**	
X8ST3-F X8STE	**1**				**117385-024**	**117422-024**	
X8STi X8STi-F X8STi-LN4 X8STi-3F	**1**						**117423-024**

Naming Key: X8*uvwxyz*

● System RES-*x*2XR3S and RES-*x*1XR3, where *x* = 3, 2, or 1

u: D = Double CPU sockets
S = Single CPU socket

v: A = Sound chip; no graphics chip
T = Graphics chip; no sound chip

w: Not applicable

x: i = SATA only
3 = SAS 1.0
6 = SAS 2.0

y: LN4 = Extra gigabit Ethernet controller for two extra ports

z: F = IPMI
blank = No IPMI

Table 3. RES-*x*2XR3/FIO 16” Chassis Manual Matrix (AC and DC Power Supplies)

Mother-board	**CPU Soc kets**	**RES-32XR3/FIO Manual P/N**	**RES-22XR3/FIO Manual P/N**
X8DAH+-F*****	**2**	**117611-024**	
X8DTU-F	**2**		**117664-024**

Naming Key: X8*uvwxyz* ● System RES-*x*2XR3S and RES-*x*1XR3, where
x = 3, 2, or 1

*RES-32XR3/FIO motherboard X8DAH+-F supports both audio and video;
however, the naming key does not contain a “T” in the title.

u: D = Double CPU sockets
S = Single CPU socket

v: A = Sound chip; no graphics chip
T = Graphics chip; no sound chip

w: Not applicable

x: i = SATA only
3 = SAS 1.0
6 = SAS 2.0

y: LN4 = Extra gigabit Ethernet controller for two extra ports

z: F = IPMI
blank = No IPMI

The 1RU-high (1.75”) RES-12XR3-S for X8DTL-6/-6F has been designed to fit into a standard 19” rack and is provided with rack-mount brackets with handles. *Optional* rack-mount slides are also available. The RES-12XR3-S for X8DTL-6/-6F is rugged enough to withstand extreme shock (up to 35G), vibration, temperature, and EMI as that associated with such demanding markets as the military, aerospace, and telecommunications industries.

Note: Those customers who desire a RES-12XR3-S for X8DTL-6/-6F with **no handles or front doors** may order this option instead of the basic model shown throughout this manual of the RES-12XR3-S for X8DTL-6/-6F with two handles and two front doors and filters.

The two quad-core/dual-core Intel 5500-Series Xeon CPUs operate with a QPI up to 6.4 GT/s and support up to 48 GigaBytes of DDR3 1333/1066/800-MHz ECC Registered DIMM memory modules. The RES-12XR3-S for X8DTL-6/-6F is based on the functionality and capability of the following Intel chipset:

- Intel 5500 (Tylersburg) chipset
- ICH10R + IOH-24D

An overview of RES-12XR3-S for X8DTL-6/-6F design and specifications is given in Chapter 1, "Overview and Specifications", of this manual.

This manual is intended for an experienced system administrator with a knowledge of both networking and high-speed server systems.

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Notes, Cautions, Warnings, and Sidebars

The following icons and formatted text are included in this document for the reasons described:

Note: A note provides additional information concerning the procedure or action being described.

Caution: A caution describes a procedure or action that may result in damage to the equipment. This may involve—but is not restricted to—heavy equipment or sharp objects. To reduce the risk, follow the instructions accompanying this symbol.

Warning: A warning describes a procedure or action that may cause injury or death to the operator. To reduce the risk, follow the instructions accompanying this symbol.

Sidebar: A “sidebar” adds detail to the section within which it is placed, but is not absolutely vital to the description or procedure of the section.

General Section

Chapter 1

Overview and Specifications

1.1 Overview

The RES-12XR3-S for X8DTL-6/-6F, (see *Figure 1-1*; a block diagram is given in *Figure 1-2*, page 1-3), is a rack-mounted system designed for above-average shock and vibration environments. The RES-12XR3-S for X8DTL-6/6F supports dual Intel® 1366-pin LGA 64-bit Xeon™ 5500/5600-Series processors, each with a QPI (Quick-Path Interconnect) up to 6.4 GT/s and 48-GB 1333/1066/800-MHz ECC Registered memory modules. Its many computer/graphics-intensive and diverse-I/O capabilities are ideal for military/aerospace and commercial telecommunications applications. Motherboard options supported by RES-12XR3-S for X8DTL-6/-6F are listed in *Table 1-1* on page 1-2.

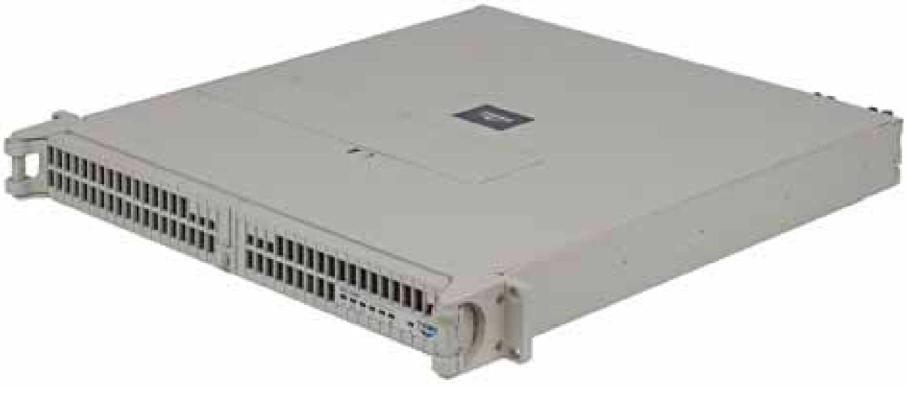


Figure 1-1. RES-12XR3-S for X8DTL-6/-6F

Table 1-1. RES-12XR3-S for X8DTL-6/-6F Motherboard Options

Motherboard[a]	**IPMI**	**SATA**	**SAS**	**Memory Slots**	**Graphics**	**Audio**	**PCI-e Slots**		
							PCI-e 2.0 x8	**PCI-e 2.0 x4**	**PCI-e x4**
X8DTL-6F	Yes	Yes	Yes	6	Yes	No	1[b]	2[c]	1[c]
X8DTL-6	No	Yes	Yes	6	Yes	No	1[b]	2[c]	1[c]

a—SuperMicro Computer, Inc.

b—in x16 slot.

c—in x8 slot

The RES-12XR3-S for X8DTL-6/6F is designed within a 1RU-high (1.75”) form-factor 17” (43.2 cm) deep and 17” (43.2 cm) wide (which, with mounting brackets, fits a 19”-wide rack). Major features of the RES-12XR3-S for X8DTL-6/-6F motherboard are listed in *Table 1-2*.

Table 1-2. RES-12XR3-S for X8DTL-6/6F Major Features

Processors	● Two Quad Core Intel® 5600/5500 Series Xeon Processors
Chipset	● Intel® 5500 (Tylersburg) chipset ● ICH10R + 2x IOH-24D
Memory	● 6 240-pin DIMM sockets ● Up to 48 GB of total memory ● 1333/1066/800-MHz DDR3 ECC-Registered Memory Modules
Peripheral Support	● Eight SAS ports from the motherboard (RAID 0, 1, 5, 10 support—Windows; RAID 0, 1, 10 support—Linux) ● Six SATA ports/six SATA storage drives supported ● 1 combination CD-RW/DVD-ROM slimline drive
Expansion slots	● See *Table 1-1* for details
Rear-Panel I/O	● See *Table 1-4* on page 1-8 for details
Operating temperature[a]	● 0° up to 65° C (32° up to 149°F)
Shock endurance[a]	● 35G @ 25-msec duration (3 axis)
Dimensions	● 1.75” (1RU) high, 17” (43.2 cm) wide (19”/48.3 cm with mounting brackets), 17” (43.2 cm) deep
Rack-mount brackets and slides	● Left and right rack-mount tabs are attached to the chassis ● Left and right rack-mount slides are *optional*
Dual power supplies	● 750 watts each, auto-ranging (100–265 VAC) ● Load-sharing N+1 redundant, hot-pluggable ● (*Optional*)—Choice of 750-watt (48V) or 500-watt (28V) DC Power supply

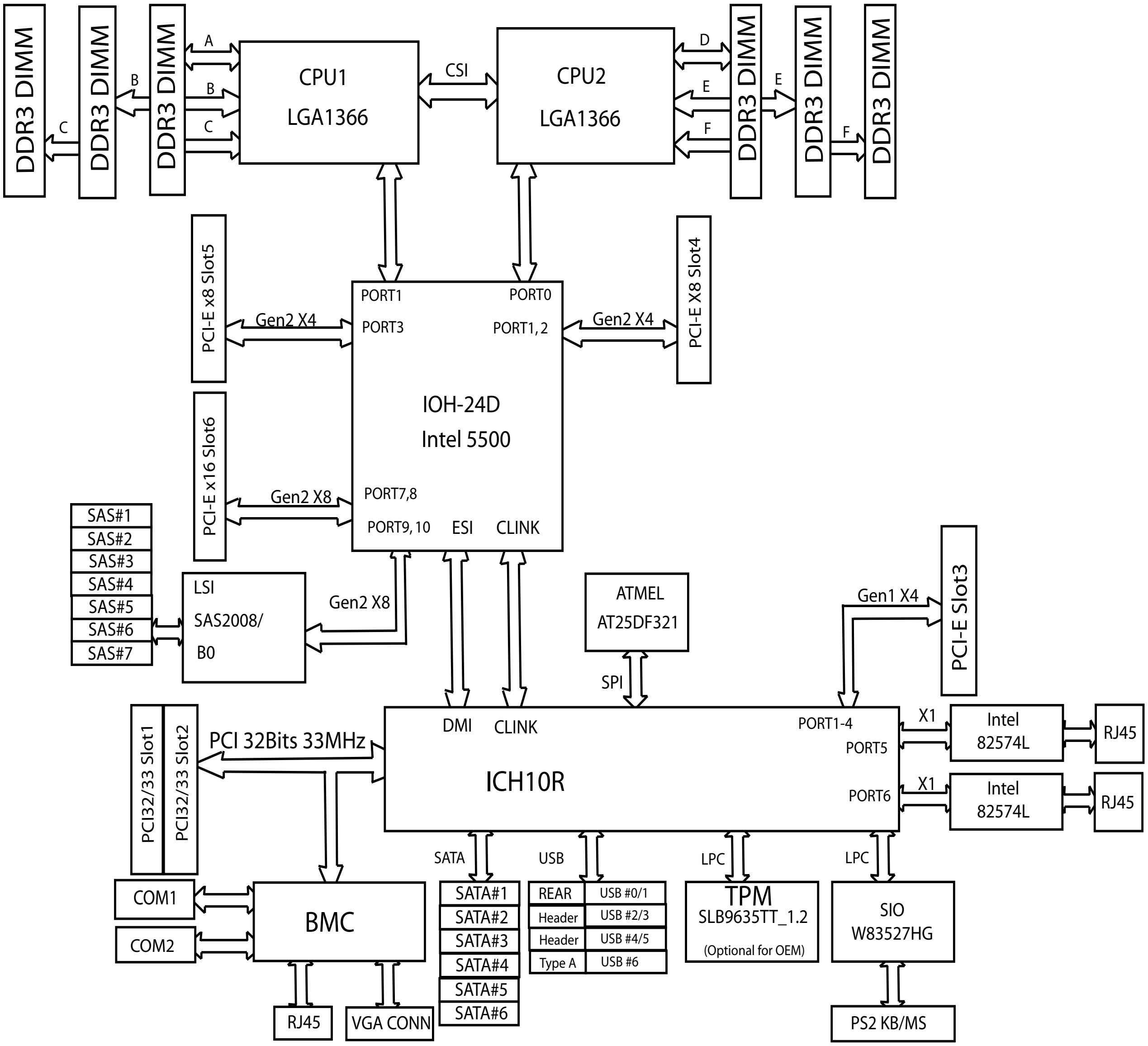

DDR3 DIMM
DDR3 DIMM
DDR3 DIMM
A
B
C
B
C
CPU1
LGA1366
CSI
CPU2
LGA1366
D
E
F
E
F
DDR3 DIMM
DDR3 DIMM
DDR3 DIMM
PCI-E x8 Slot5
Gen2 X4
PORT1
PORT3
PORT0
PORT1, 2
Gen2 X4
PCI-E X8 Slot4
IOH-24D
Intel 5500
PCI-E x16 Slot6
Gen2 X8
PORT7,8
PORT9, 10
ESI
CLINK
SAS#1
SAS#2
SAS#3
SAS#4
SAS#5
SAS#6
SAS#7
LSI
SAS2008/
B0
Gen2 X8
ATMEL
AT25DF321
SPI
Gen1 X4
PCI-E Slot3
PCI32/33 Slot1
PCI32/33 Slot2
PCI 32Bits 33MHz
DMI
CLINK
ICH10R
PORT1-4
PORT5
PORT6
X1
X1
Intel
82574L
Intel
82574L
RJ45
RJ45
SATA
USB
LPC
LPC
COM1
COM2
BMC
RJ45
VGA CONN
SATA#1
SATA#2
SATA#3
SATA#4
SATA#5
SATA#6
REAR
Header
Header
Type A
USB #0/1
USB #2/3
USB #4/5
USB #6
TPM
SLB9635TT_1.2
(Optional for OEM)
SIO
W83527HG
PS2 KB/MS

Figure 1-2. X8DTL-6 Motherboard Block Diagram

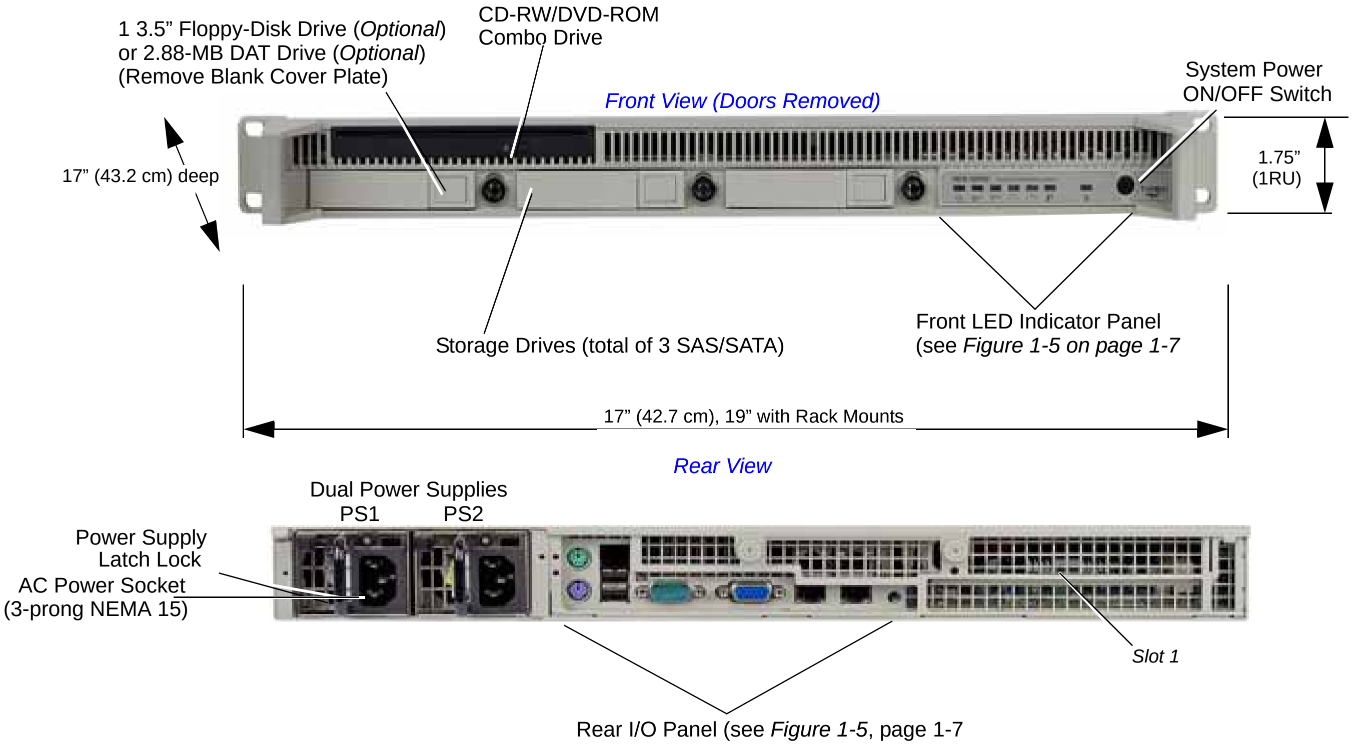

1 3.5” Floppy-Disk Drive (Optional)
or 2.88-MB DAT Drive (Optional)
(Remove Blank Cover Plate)
CD-RW/DVD-ROM
Combo Drive
System Power
ON/OFF Switch
Front View (Doors Removed)
17” (43.2 cm) deep
1.75”
(1RU)
Storage Drives (total of 3 SAS/SATA)
Front LED Indicator Panel
(see Figure 1-5 on page 1-7
17” (42.7 cm), 19” with Rack Mounts
Rear View
Dual Power Supplies
PS1
PS2
Power Supply
Latch Lock
AC Power Socket
(3-prong NEMA 15)
Slot 1
Rear I/O Panel (see Figure 1-5, page 1-7

Figure 1-3. External Features of RES-12XR3-S for X8DTL-6/6F (Front and Rear)

The RES-12XR3-S for X8DTL-6/-6F front panel houses three removable storage drive bays (see *Figure 1-3*). Both SAS and SATA drives are supported by the X8DTL-6 and X8DTL-6F motherboards. Drive requirements should be specified at the time the system is purchased.

Also included on the front panel is a reset switch and the system power button and LEDs (see *Figure 1-5* on page 1-6). The rear panel contains two AC power supplies with latch locks and power-cord sockets, and all I/O connectors (see *Figure 1-5* on page 1-6).

Major internal components of the RES-12XR3-S for X8DTL-6/-6F can be seen in the open top view (cover removed) of *Figure 1-4* on page 1-5.

1.2 System LEDs and I/O Connectors

All RES-12XR3-S for X8DTL-6/6F system LEDs are located on the front panel (see **A**, *Figure 1-5* on page 1-6); all I/O connectors are located on the rear panel (see **B**, *Figure 1-5*).

LEDs are described in *Table 1-3* on page 1-7; I/O connectors are described in *Table 1-4*, page 1-8.

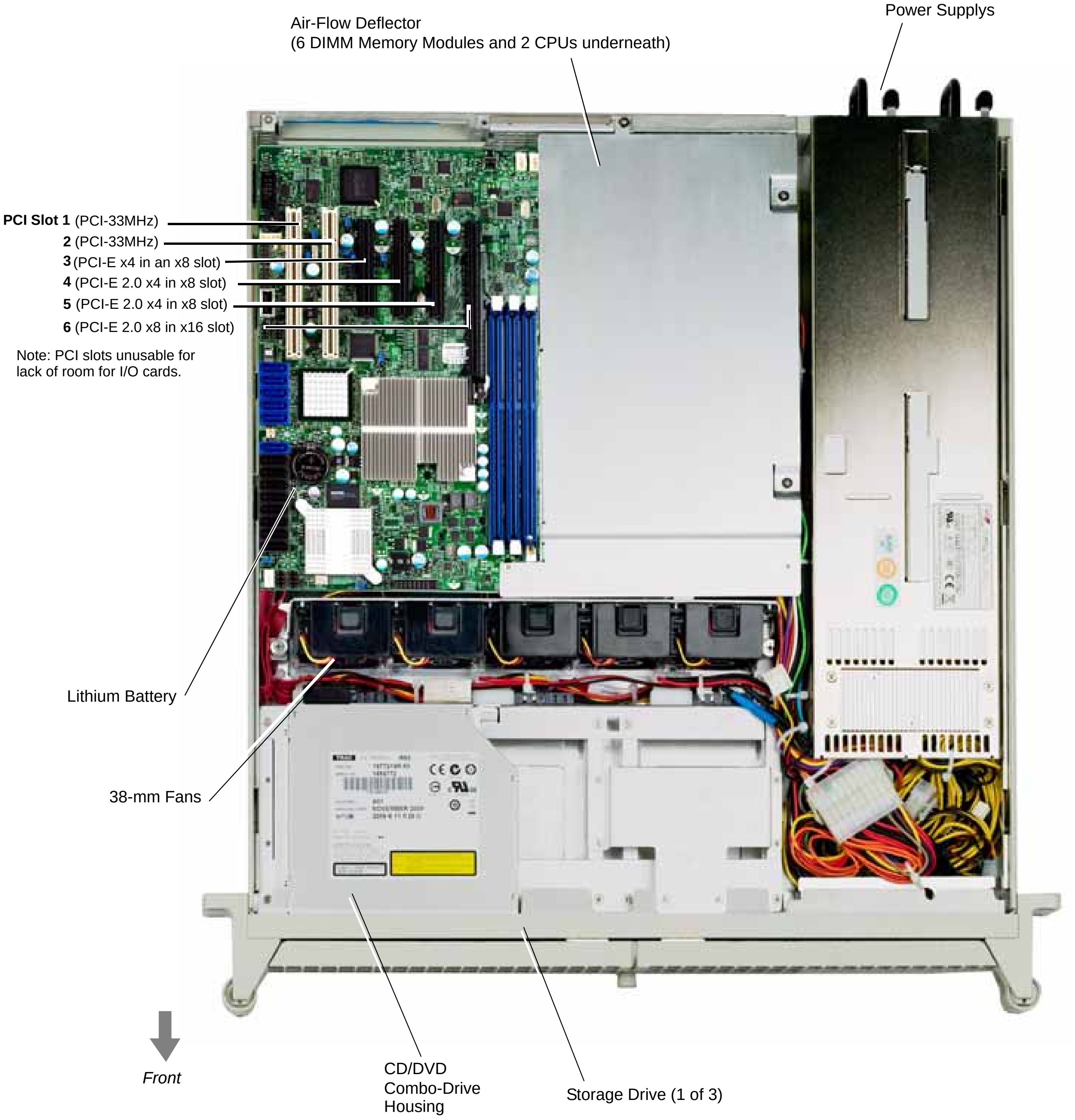

Air-Flow Deflector
(6 DIMM Memory Modules and 2 CPUs underneath)
Power Supplys
PCI Slot 1 (PCI-33MHz)
2 (PCI-33MHz)
3 (PCI-E x4 in an x8 slot)
4 (PCI-E 2.0 x4 in x8 slot)
5 (PCI-E 2.0 x4 in x8 slot)
6 (PCI-E 2.0 x8 in x16 slot)
Note: PCI slots unusable for lack of room for I/O cards.
Lithium Battery
38-mm Fans
Front
CD/DVD Combo-Drive Housing
Storage Drive (1 of 3)

Figure 1-4. Major Components of RES-12XR3-S for X8DTL-6/-6F (Open Top View)

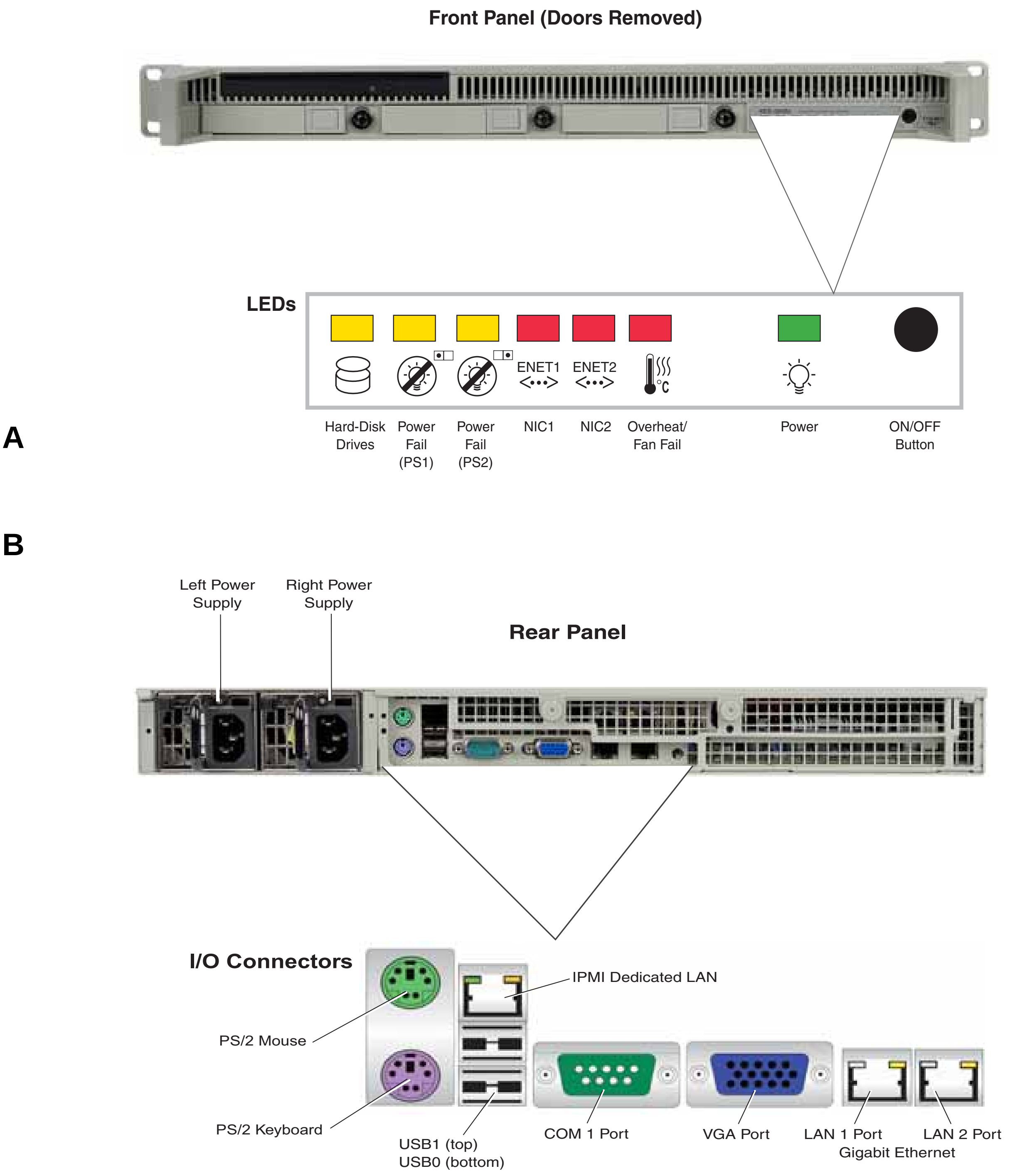
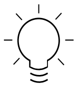
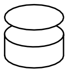
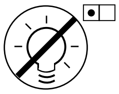
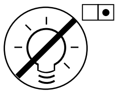
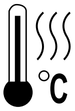

Front Panel (Doors Removed)
LEDs
ENET1
ENET2
Hard-Disk Drives
Power Fail (PS1)
Power Fail (PS2)
NIC1
NIC2
Overheat/ Fan Fail
Power
ON/OFF Button
A
B
Left Power Supply
Right Power Supply
Rear Panel
I/O Connectors
IPMI Dedicated LAN
PS/2 Mouse
PS/2 Keyboard
USB1 (top)
USB0 (bottom)
COM 1 Port
VGA Port
LAN 1 Port
LAN 2 Port
Gigabit Ethernet

Figure 1-5. RES-12XR3-S for X8DTL-6/-6F System LEDs and I/O Connectors

Table 1-3. System LEDs

Symbol	LED	Description
	Power	● Indicates that the system is turned on.
	Storage Drive (SD)	● Indicates SAS/SATA storage drive activity.
ENET1 <•••>	NIC1[a] (Gb Ethernet)	● Indicates network activity on LAN 1.
ENET2 <•••>	NIC2 (Gb Ethernet)	● Indicates network activity on LAN 2.
	Power Fail (Left Power Supply)	● Warns that there is a failure in the left power supply.
	Power Fail (Right Power Supply)	● Warns that there is a failure in the right power supply.
	Overheat/Fan Fail —Normally OFF —RED light when temperature limits are exceeded	● Warns that the system is exceeding specified temperature parameters. The CPU overheat warning function must be enabled in the BIOS, thus allowing the user to define an overheat temperature, which—when exceeded—triggers the overheat warning LED.
Symbol	**Rear Panel LED(s)**	**Description**
N/A	LAN1 and LAN2	Each Ethernet port contains two LEDs: ● The color of the left LED (when facing the port) indicates the LAN connection speed: - Off = 10 MHz - Green = 100 MHz - Amber = 1 GHz ● The right LED, when lit, indicates LAN activity.

[a] —NIC = Network Interface Controller.

Table 1-4. I/O Connectors

Connector	Description
PS/2 Mouse	● 6-pin mini-DIN (female) connector to attach a PS/2 mouse device.
PS/2 Keyboard	● 6-pin mini-DIN (female) connector to attach a PS/2 keyboard device.
Hi-Speed USB 2.0 Serial Ports	● Two 4-pin USB connectors to attach serial devices to USB Port 0 and USB Port 1. *Note:* One additional USB port can be accessed directly from the motherboard, with 2 additional headers, for a total of three additional USB ports.
COM 1 Serial Port	● One DB9 (male) connector on rear panel to attach a serial device to the COM 1 port. *Note:* An additional serial port (COM 2) can be accessed directly from the motherboard.
VGA Port	● 15-pin VGA connector to attach a monitor device.
Ethernet LAN Ports	● Standard RJ45 connectors to attach one or two gigabit Ethernet LAN line(s)—LAN 1 and LAN 2.
IPMI Dedicated LAN Port	● Standard RJ45 connector to attach a dedicated IPMI LAN line (X8DTL-6F only).

1.3 Chipset Overview

Built upon the functionality and the capability of the 5500 platform, the RES-12XR3-S for X8DTL-6/-6F motherboard provides the performance and feature set required for dual-processor-based high-end systems optimized for HCP/Cluster systems and intensive applications. The 5500 platform consists of the 5500 Series (LGA 1366) processor, the 5500 (IOH-24D), and the ICH10R (South Bridge). With the Intel QuickPath interconnect (QPI) controller built in, the 5500 platform is the first dual-processing platform that offers the next generation point-to-point system interconnect interface, replacing the current Front Side Bus Technology, substantially enhancing system performance with increased bandwidth and scalability.

The 5500 (IOH-24D) connects to each processor through an independent Quick-Path Interconnect (QPI) link. Each link consists of 20 pairs of unidirectional differential lanes for transmitting and receiving in addition to a differential forwarded clock. A full-width QPI link pair provides 84 signals. Each processor supports two QuickPath links, one going to the other processor and the other to the 5500 (IOH-24D).

The 5500 Platform supports up to 24 PCI Express Gen2 lanes, peer-to-peer read and write transactions. The ICH10R provides up to 4 PCI-Express ports, six SATA ports and 7 USB connections.

In addition, the 5500 platform also offers a wide range of RAS (Reliability, Availability and Serviceability) features. These features include memory interface ECC, x4/x8 Single Device Data Correction (SDDC), Cyclic Redundancy Check (CRC), parity protection, out-of-band register access via SMBus, memory mirroring, and Hot-plug support on the PCI-Express Interface.

1.3.1 Main Features of the 5500 Series Processor and the 5500 Chipset

- Four processor cores in each processor with 8MB shared cache among cores
- Two full-width Intel QuickPath interconnect links, up to 6.4 GT/s of data transfer rate in each direction
- Virtualization Technology, Integrated Management Engine supported
- Point-to-point cache coherent interconnect, Fast/narrow unidirectional links, and Concurrent bi-directional traffic
- Error detection via CRC and Error correction via Link level retry

1.4 Special Features

1.4.1 Recovery from AC Power Loss

BIOS provides a setting for you to determine how the system will respond when AC power is lost and then restored to the system. You can choose for the system to remain powered off (in which case you must press the power switch to turn it back on) or for it to automatically return to a power-on state. See the Advanced BIOS Setup section to change this setting. The default setting is **Last State**.

1.5 PC Health Monitoring

This section describes the PC health monitoring features of the RES-12XR3-S for X8DTL-6/-6F motherboard. All have an onboard System Hardware Monitor chip that supports PC health monitoring. An onboard voltage monitor will scan these onboard voltages continuously: CPU0 Vcore, CPU1 Vcore, 1.5V, 5V, 5VSB, 12V, -12V, 3.3Vcc, 3.3VSB, VBAT and Vtt. Once a voltage becomes unstable, a warning is given or an error message is sent to the screen. Users can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

1.5.1 Fan Status Monitor with Firmware Control

The PC health monitor can check the RPM status of the cooling fans. The onboard CPU and chassis fans are controlled by Thermal Management in the BIOS (under Hardware Monitoring in the Advanced section).

1.5.2 Environmental Temperature Control

The thermal control sensor monitors the CPU temperature in real time and will turn on the thermal control fan whenever the CPU temperature exceeds a user-defined threshold. The overheat circuitry runs independently from the CPU. Once it detects that the CPU temperature is too high, it will automatically turn on the thermal fan control to prevent any overheat damage to the CPU. The onboard chassis thermal circuitry can monitor the overall system temperature and alert users when the chassis temperature is too high.

Caution: To avoid possible system overheating, please be sure to provide adequate airflow to your system.

1.5.3 System Resource Alert

This feature is available when used with Supero Doctor III in the Windows OS environment or used with the Supero Doctor II in Linux. Supero Doctor is used to notify the user of certain system events. For example, you can also configure Supero Doctor to provide you with warnings when the system temperature, CPU temperatures, voltages and fan speeds go beyond a pre-defined range.

1.6 ACPI Features

ACPI stands for Advanced Configuration and Power Interface. The ACPI specification defines a flexible and abstract hardware interface that provides a standard way to integrate power management features throughout a PC system, including its hardware, operating system and application software. This enables the system to automatically turn on and off peripherals such as CD-ROMs, network cards, storage drives and printers.

In addition to enabling operating system-directed power management, ACPI provides a generic system event mechanism for Plug and Play and an operating system-independent interface for configuration control. ACPI leverages the Plug and Play BIOS data structures while providing a processor architecture-independent implementation that is compatible with Windows XP, Windows 2003 and Windows 2008 and Windows Vista Operating Systems.

1.6.1 Slow Blinking LED for Suspend-State Indicator

When the CPU goes into a suspend state, the chassis power LED will start blinking to indicate that the CPU is in suspend mode. When the user presses any key, the CPU will wake-up and the LED will automatically stop blinking and remain on.

1.6.2 Main Switch Override Mechanism

When an ATX power supply is used, the power button can function as a system suspend button to make the system enter a SoftOff state. The monitor will be suspended and the hard drive will spin down. Pressing the power button again will cause the whole system to wake-up. During the SoftOff state, the ATX power supply provides power to keep the required circuitry in the system “alive.” In case the system malfunctions and you want to turn off the power, just press and hold the power button for 4 seconds. This option can be set in the Power section of the BIOS Setup routine.

1.6.3 Wake-on-LAN (WOL)

Wake-On-LAN is defined as the ability of a management application to remotely power up a computer that is powered off. Remote PC setup, up-dates and asset tracking can occur after hours and on weekends so that daily LAN traffic is kept to a minimum and users are not interrupted. The motherboard has a 3-pin header (WOL) to connect to the 3-pin header on a Network Interface Card (NIC) that has WOL capability. In addition, an onboard LAN controller can also support WOL without any connection to the WOL header. The 3-pin WOL header is to be used with a LAN add-on card only.

1.7 Super I/O

The Super I/O supports 360 K, 720 K, 1.2 M, 1.44 M or 2.88 M disk drives and data transfer rates of 250 Kb/s, 500 Kb/s or 1 Mb/s. It also provides two high-speed, 16550 compatible serial communication ports (UARTs). Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability and a processor interrupt system. Both UARTs provide legacy speed with baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250 K, 500 K, or 1 Mb/s, which support higher speed modems.

The Super I/O provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power management through an SMI or SCI function pin. It also features auto power management to reduce power consumption.

1.8 Overview of the Winbond WPCM450R Controller

The Winbond WPCM450R Controller is a Baseboard Management Controller (BMC) that supports the 2D/VGA-compatible Graphics Core with the PCI interface, Virtual Media, and Keyboard/Video/Mouse Redirection (KVMR) modules. With blade-oriented Super I/O capability built-in, the WPCM450R Controller is ideal for legacy-reduced server platforms.

The WPCM450R interfaces with the host system via a PCI interface to communicate with the Graphics core. It supports USB 2.0 and 1.1 for remote keyboard/mouse/virtual media emulation. It also provides LPC interface to control Super IO functions. The WPCM450 is connected to the network via an external Ethernet PHY module.

The WPCM450 communicates with onboard components via six SMBus interfaces, fan control, and Platform Environment Control Interface (PECI) buses.

1.9 Specifications

1.9.1 General

Table 1-5 lists general specifications for the RES-12XR3-S for X8DTL-6/6F.

Table 1-5. RES-12XR3-S for X8DTL-6/6F General Specifications

Parameter	Description
Dimensions	● 1.75” (1RU) high ● 17” (43.2 cm) wide (19” rack-mountable) ● 17” (43.2 cm) deep
Weight	● Approximately 17.0 pounds (7.7 kg), includes 2 CPUs, 6 DIMMs, 2 full-length (up to 12.25”) PCI cards, 1 CD-RW/DVD-ROM drive, 2 storage drives, and 2 power supplies ● Add 8.8 pounds (4 kg) for the shipping container and two AC power cords ● The manual and associated shipping paperwork weigh approximately 1 lb (0.45 kg)
19” Rack-Mountable with Slide capability	● Left and right rack-mount tabs attached to chassis ● Left and right rack-mount slides are *optional*
Temperature[a] Operating: Non-Operating:	● 0° up to 65° C (32° up to 149°F) ● –40° to 70° C (–40° to 158° F)
Relative Humidity[a] Operating: Non-Operating:	● 8% to 95% (non-condensing) ● 5 to 95% (non-condensing)

Table 1-5. RES-12XR3-S for X8DTL-6/6F General Specifications (Continued)

Parameter	**Description**
Maximum Wet Bulb[a] Operating: Non-Operating:	- 55°C, non-condensing - 70°C, non-condensing
Altitude[a] Operating: Non-Operating	- 0 to 10,000 feet above sea level - 0 to 40,000 feet above sea level

a—Specifications are dependent on the configuration in this manual.

1.9.2 Electrical

Table 1-6 lists the electrical specifications for the RES-12XR3-S for X8DTL-6/6F.

Table 1-6. RES-12XR3-S for X8DTL-6/6F Electrical Specifications

Parameter	**Description**		
	AC (120 volts, 750W)	**DC (48 volts, 750W)**	**DC (28 volts, 500W)**
Input Power (*typical*)	- 420 watts (*typical*)[a]	- 420 watts (*typical*)[a]	- 450 watts (*typical*)[a]
Input Current	- 3.5 amperes @120 Vac	- 13.5 amperes @48 Vdc	- 16 amperes @28 Vdc
Input Frequency	- 47–63 Hertz	*NA*[b]	*NA*[b]
Input Voltage	- 100–265 Vac, internally fused	- 40–72 Vdc, internally fused	- 18–36 Vdc, internally fused
Input VA Rating	- 425 VA	*NA*	*NA*
BTU Rating	- 1447 BTU/hour	- 1447 BTU/hour	- 1447 BTU/hour
Power Factor	- 0.99	*NA*	*NA*
Input Leakage Current	- 3.5 mA	*NA*	*NA*
Plug Type	- IEC	- Y-Type (SVS5-4 or equivalent)	- Y-Type (SVS5-4 or equivalent)

a—Does not include plug-in PCI cards.

b—*NA* = Not Applicable.

1.9.2.1 System Power

The RES-12XR3-S for X8DTL-6/6F operates with two N+1 redundant AC power supplies of 750-watts capacity each that auto-range single-phase AC input from 100 to 240 VAC (47 to 63 Hertz) sources. Filtered and fused (internal) AC is supplied to each power supply from a rear-mounted power connection.

Two *optional* N+1 redundant DC power supplies of 750 watts (48 volts) or 500 watts (28 volts) each may be substituted for the AC power supplies (see *Table 1-6*). These supplies should be specified at the time of your order.

Note: Some AC RES systems may be installed with **650-watt** instead of **750-watt** power supplies, which should not affect the performance of the system.

1.9.2.2 Output Voltage

The RES-12XR3-S for X8DTL-6/6F power supply provides output voltages that are split between +3.3V, +5V, $+5V_{sb}$, +12V, and -12V rails.

1.9.3 Environmental

1.9.3.1 Shock

The RES-12XR3-S for X8DTL-6/-6F is designed to survive an elevated shock environment. All structural components are welded together, enabling the system to survive a maximum 3-axis shock load of 35G at 25-ms duration.

1.9.3.2 Electrostatic Discharge

The RES-12XR3-S for X8DTL-6/-6F is designed to tolerate electrostatic pulses up to 15 kilovolts (KV) with no impact on system operation.

1.9.3.3 Noise

The RES-12XR3-S for X8DTL-6/6F conforms to the 54-db noise specification. It is possible to achieve further noise reduction by installing a sound baffle (muffler) on both the front (see *Figure 1-7*) and the rear (see *Figure 1-7* on page 1-17) of the RES-12XR3-S for X8DTL-6/6F chassis. Call your Themis representative for additional information. (*Figure 1-6* and *Figure 1-7* on page 1-17 illustrate sound baffles installed on a RES-22XR3 chassis. Sound baffle installation on the RES-12XR3-S for X8DTL-6/6F is similar.)

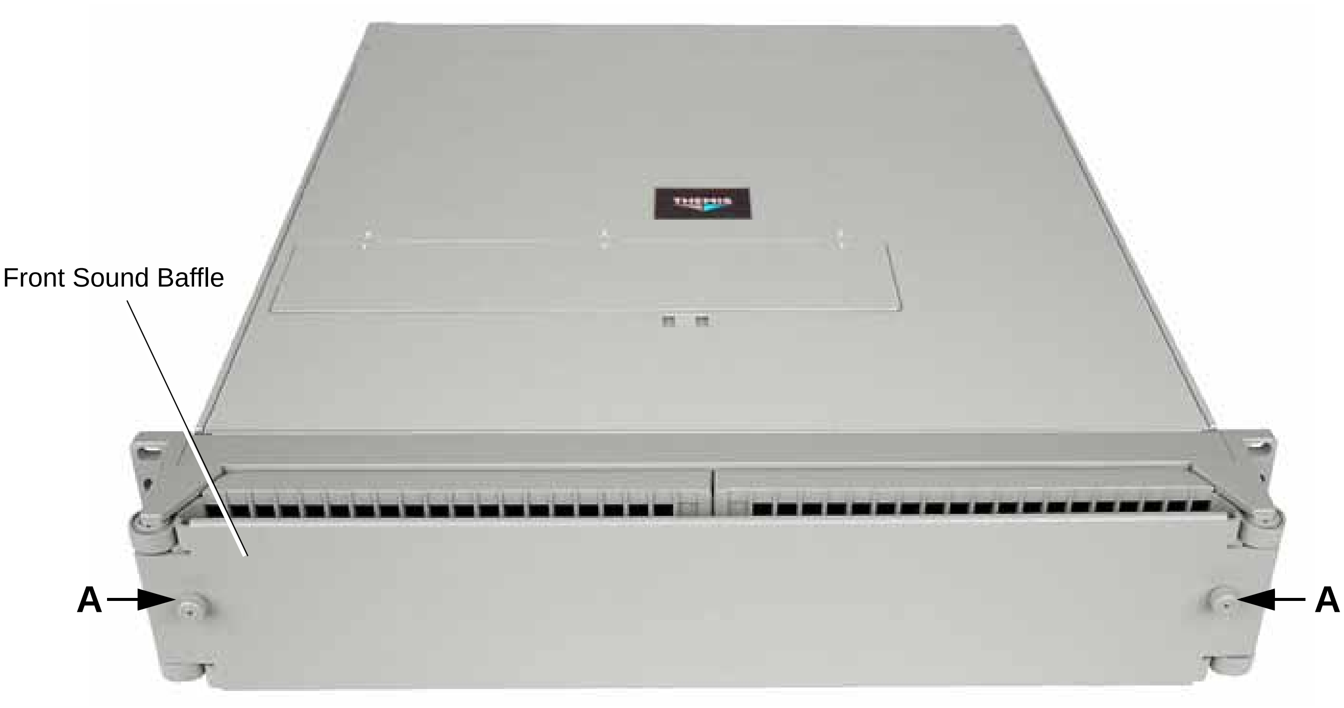


Figure 1-6. RES-22XR3 with Front Sound Baffle Installed (Front View)

✓ ***Note:*** All RES systems are shipped with BIOS fan speed set to the quietest mode. The default fan speed control mode of the RES-12XR3-S for X8DTL-6/-6F is **Energy Saving/ES.**

Front Access—Opening the two front doors of the RES-12XR3-S for X8DTL-6/6F requires removing the front sound baffle. To do this, loosen the two (2) captive knurled Phillips screws holding the baffle to the chassis (see **A** in *Figure 1-7*, page 1-

17) and remove the baffle.

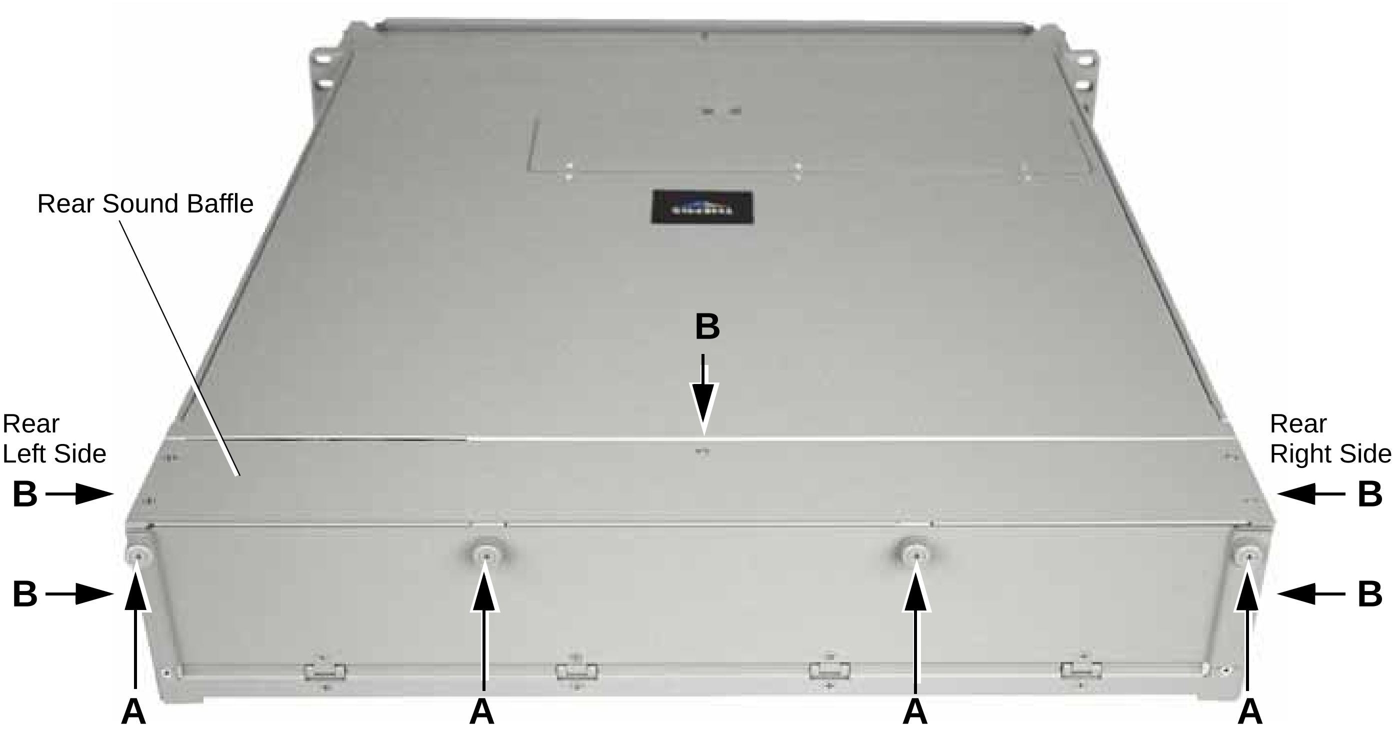


Figure 1-7. RES-22XR3 with Rear Sound Baffle Installed (Rear View)

Rear Access—Accessing the I/O connectors and PCI card I/O on the rear of the RES-12XR3-S for X8DTL-6/-6F requires opening the rear sound baffle door. To do this, loosen the four (4) captive knurled Phillips screws **A** holding the baffle door to the chassis (see **A** in *Figure 1-7*) and swing the door downward away from the chassis, exposing the rear connectors and PCI cards.

Removing the protective top cover for access to the interior requires that the rear sound baffle be totally removed (this can be done with the baffle door closed). To do this, five (5) M3x4 flathead Phillips screws **B** must be removed, two on each side of the baffle and one (captive) in the middle on the top (see *Figure 1-7*).

After removing the rear baffle, the top cover can be removed as described in Section 2.1.2, “Memory Modules,” on page 2-3 (Chapter 2, "Installation and Operation").

1.10 Packaging and Shipping

The RES-12XR3-S for X8DTL-6/6F is packaged in a reusable shipping container. Approximate weight of an empty container and two AC power cords is 8.8 pounds (4 kg).

The approximate weight of a RES-12XR3-S for X8DTL-6/-6F (loaded with 2 CPUs, 6 DIMMs, 2 storage drives, 2 PCI cards, a CD-RW/DVD-ROM drive, and 2 power supplies) is approximately 23 pounds (10.4 kg). [See *Table 1-7* on page 1-19 for a general weight table for all models of the RES Series.]

The approximate weight of a manual and associated shipping paperwork is one pound (0.45 kg).

Therefore, both the shipping container and a fully installed RES-12XR3-S for X8DTL-6/6F including power cords, manual, and associated paperwork, weigh under 33 pounds (15 kg).

Caution: **Do not discard the original packaging** in which your system was shipped.

The original packaging was designed specifically to withstand the stress and rigors of today's shipping environment. It will be needed in the event the system must be shipped back to Themis Computer. For re-packing instructions, refer to Appendix E, "Re-Packaging for Shipment"

1.10.1 Accessory Kit

Each RES-12XR3-S for X8DTL-6/-6F is packaged with an Accessory Kit, consisting of the following items:

A. A Power-cord Retainer Bracket

B. Two AC Power Cords

C. Two Storage Drive Barrel Keys

When you unpack the RES-12XR3-S for X8DTL-6/-6F, please verify that all of these items are included. If any of these items are missing or not as pictured, please call Themis Technical Support at 510-252-0870, or send an email to support@themis.com.

To learn how to secure the AC power cords and the power-cord retainer bracket, refer to Section 2.3.1, “Plugging in the AC Power Cords,” on page 2-17.

1.10.2 Rack-Mount Slides (Optional)

Rack-Mount Slides can be mounted on each side of the RES-12XR3-S for X8DTL-6/-6F for the purpose of sliding the unit in and out of a rack. Mounting slides are optional and can be ordered at the time of purchase.

To learn how to install rack-mount slides, refer to Appendix B, “Rack-Mount Slide Installation”..

Table 1-7. Approximate Weights of the RES Series

Model	Weight (Approximate)	CPU Sockets	Depth	Description
RES-12XR3	19.5 lbs (8.9 kg)	2	20”	Includes: ● All CPU sockets filled ● 6 DIMMs ● 2 storage drives ● 2 PCI cards ● 1 CD-RW/DVD-ROM drive ● 2 power supplies
RES-12XR3-S	17 lbs (7.7 kg)	2	17”	
RES-11XR3	16.5 lbs (7.5 kg)	1	17”	
RES-22XR3	25 lbs (11.4 kg)	2	20”	Includes: ● All CPU sockets filled ● 6 DIMMs ● 2 storage drives ● 2 PCI cards ● 1 CD-RW/DVD-ROM drive ● 2 power supplies
RES-22XR3-S	23 lbs (10.4kg)	2	17”	
RES-22XR3/FIO	25.3 lbs (11.5kg)	2	16”	
RES-21XR3	22.5 lbs (10.2 kg)	1	17”	
RES-32XR3	28.5 lbs (12.9 kg)	2	20”	Includes: ● All CPU sockets filled ● 6 DIMMs ● 2 storage drives ● 2 PCI cards ● 1 CD-RW/DVD-ROM drive ● 2 power supplies
RES-32XR3-S	26.5 lbs (12 kg)	2	17”	
RES-32XR3/FIO	29 lbs (13.2 kg)	2	16”	
RES-31XR3	26 lbs (11.8 kg)	1	17”	

Chapter 2

Installation and Operation

This chapter describes:

- How to install a memory module, storage drive, PCI card, 38-mm-fan, power supply, and lithium battery
- Rack-mount brackets
- How to turn the RES-12XR3-S for X8DTL-6/-6F on and off

2.1 Installation Procedures

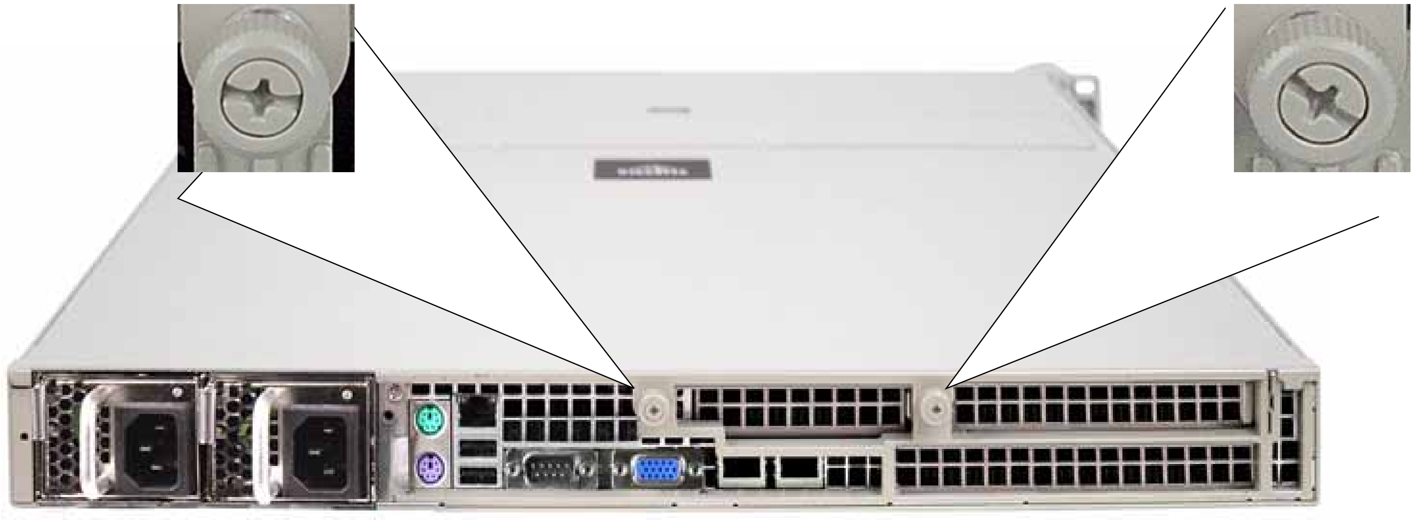
Caution: Use industry-standard ESD grounding techniques when handling all components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface. **Handle all IC cards by the front panel or edges only.**

To install or replace a SAS/SATA **storage drive**, **fan**, or **power supply**, skip the next section and proceed directly to page 2-9, page 2-13, or page 2-15, respectively. Replacement of motherboard components requires removal of the protective cover.

2.1.1 Remove Protective Top Cover

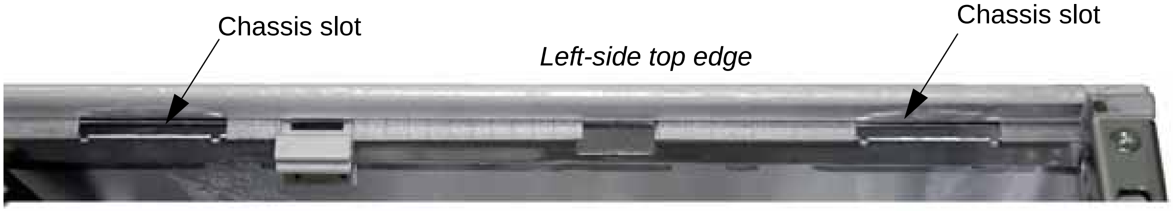
To access a motherboard component, open the RES-12XR3-S for X8DTL-6/-6F as follows:

1. Loosen the two captive Phillips screws holding the protective top access cover to the rear of the RES-12XR3-S for X8DTL-6/-6F chassis (see **A**, *Figure 2-1*).
2. Both the front and sides of the cover have flat hooks or tabs underneath that fit under slots on the chassis top edges (see **B**, *Figure 2-1*). Remove the cover by sliding it toward the rear until it is free of these chassis slots.
3. Store the cover in a safe place until it is replaced.



Rear View

A Loosen the 2 captive access-cover screws...



B ... and slide the top cover toward the rear until the top hooks and tabs clear all chassis slots

Figure 2-1. Remove the RES-12XR3-S Protective Access Cover

4. Proceed to the appropriate section to install or replace a **memory module** (page 2-3), **PCI card** (page 2-8), or **lithium battery** (page 2-8).

2.1.2 Memory Modules

The RES-12XR3-S for X8DTL-6/-6F supports memory according to *Table 2-1*.

Table 2-1. RES-12XR3-S Memory Capacity

Motherboards	Memory Parameters				
	Capacity	DDR3 Registered ECC	Speed (MHz)	Number of DIMMS	Pins per DIMM
X8DTL-6 and X8DTL-6F	48 GB	Yes	1333/1066/800	6	240

Caution: Exercise extreme caution when installing or removing FBD Memory Modules to prevent any possible damage.

Table 2-2. Memory Population for One CPU (CPU1) Installed

Memory Population for Optimal Performance -For a motherboard with One CPU (CPU1) installed (To Populate P2-DIMM slots)			
	Branch 0	Branch 1	Branch 2
3DIMMS	P1-1A	P1-2A	P1-3A

Table 2-3. Memory Population for One CPU (CPU2) Installed

Memory Population for Optimal Performance -For a motherboard with one CPU (CPU2) installed (To Populate P2-DIMM slots)			
	Branch 0	Branch 1	Branch 2
3 DIMMS	P2-1A	P2-2A	P2-3A

Table 2-4. Memory Population for 2CPUs Installed

Memory Population for Optimal Performance -For a motherboard with Two CPUs installed						
	CPU1 (To populate P1-DIMMs)			CPU2 (To populate P2-DIMMs)		
	Branch 0	Branch 1	Branch 2	Branch 0	Branch 1	Branch 2
6 DIMMs	P1-1A	P1-2A	P1-3A	P2-1A	P2-2A	P2-3A

When installing memory, follow these rules for best memory performance:

- It is strongly recommended that you *do not mix memory modules* of different speeds and sizes. If DIMMs of different speeds have been installed, verify that the BIOS setup is configured for the fastest speed of RAM used.

2.1.2.1 Installation

The following procedure explains how to install the DDR3 Memory Modules.

1. Loosen and remove the five (5) screws securing the air-flow deflector (see *Figure 2-2*).

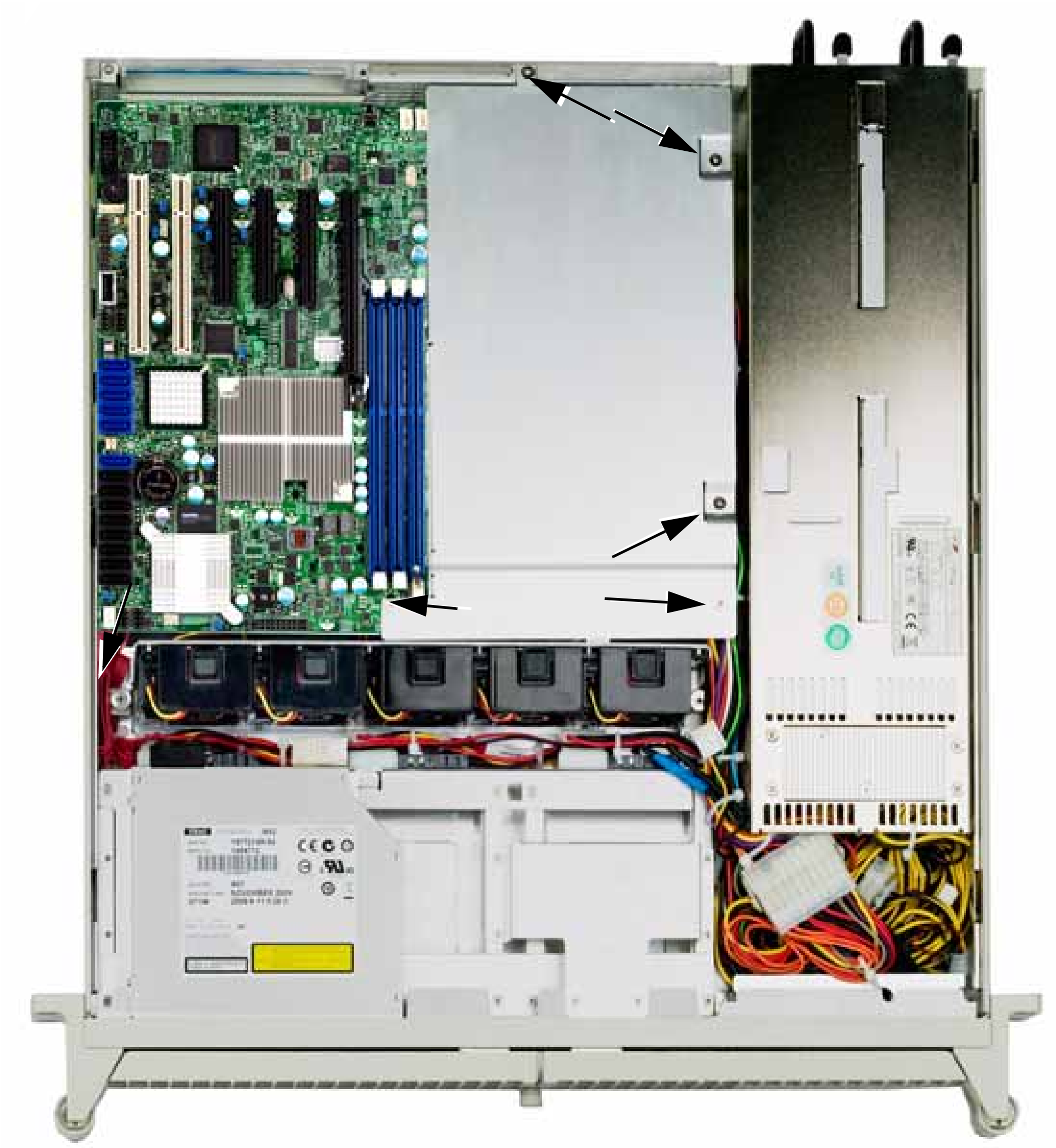


Figure 2-2. Remove RES-12XR3-S for X8DTL-6/-6F Air-Flow Deflector

2. After the air-flow deflector is removed, the memory modules will be exposed (see *Figure 2-3* on page 2-6).

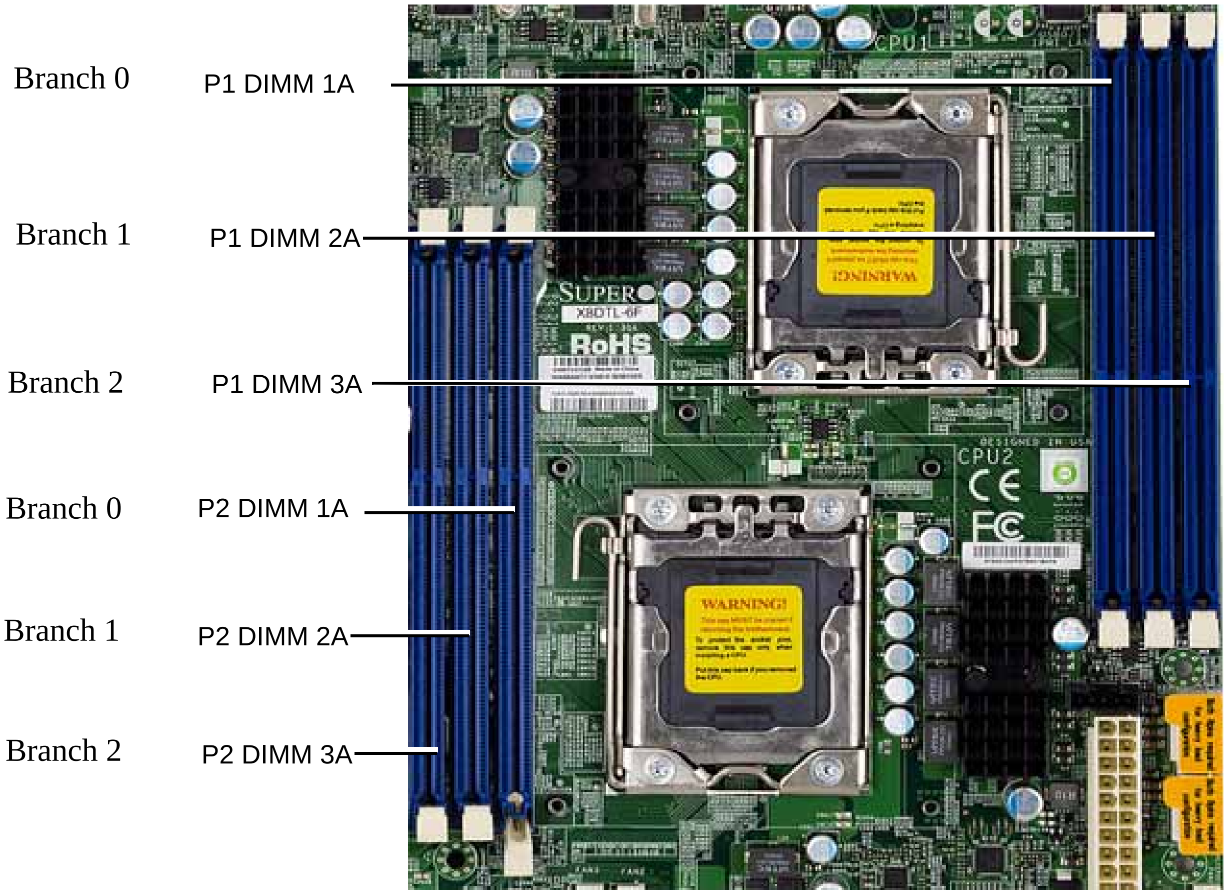

Branch 0
P1 DIMM 1A
Branch 1
P1 DIMM 2A
Branch 2
P1 DIMM 3A
Branch 0
P2 DIMM 1A
Branch 1
P2 DIMM 2A
Branch 2
P2 DIMM 3A
CPU1
CPU2
SUPER
X8DTL-6F
RoHS
WARNING!

Figure 2-3. Memory Module Slot Locations

3. If a module is already seated in the slot you have selected for installation, remove it by gently pressing down and outward on the latches at both ends of the slot (see *Figure 2-4* on page 2-7), then pulling the old module directly up from the slot until it is free of the connector (see *Figure 2-4*).

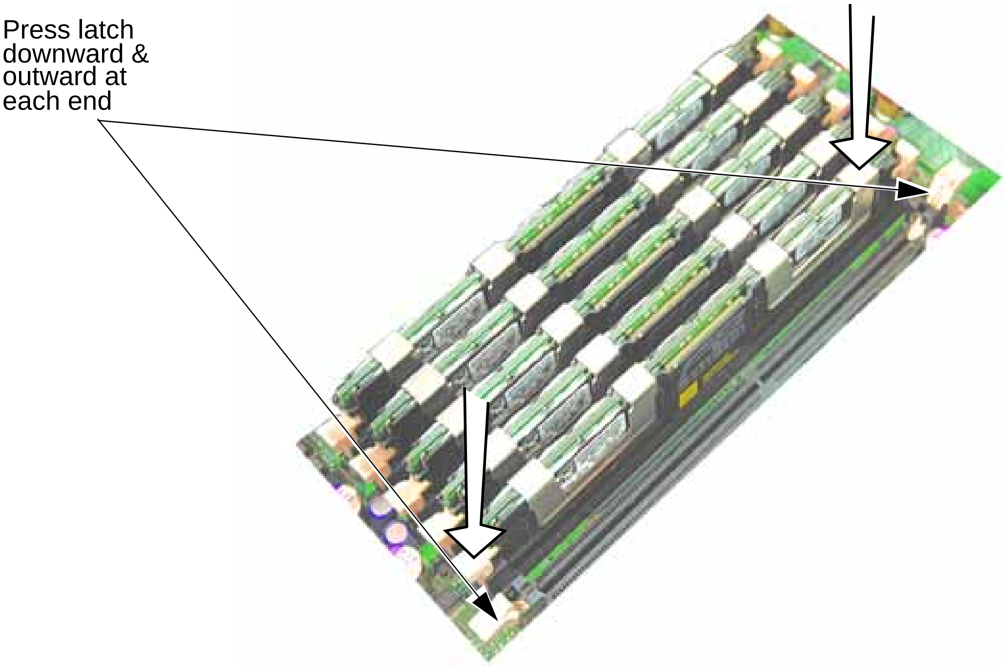


Figure 2-4. Memory Module Removal

4. Before inserting a new memory module into the vacant slot, make sure that the two latches are pulled outward away from the center of the slot.

With the latches in the outward position, gently insert the new module vertically into its slot and press firmly downward until it snaps into place.

> ✓ ***Note:*** Make sure the memory module has the proper orientation by aligning the alignment notch at the bottom edge with its counterpart ridge at the bottom of the slot.

5. If all the memory modules have been replaced in the system, replace the air flow diverter and secure it with the five screws previously removed in Step 1 on page 2-5).

2.1.3 PCI Cards

Since the RES-12XR3-S for X8DTL-6/-6F is only 1RU (1.75”) high, no room exists for PCI expansion card capability for this unit, nor is there a riser card which is suitable.

2.1.4 Lithium Battery

2.1.4.1 Removing the Lithium Battery

Perform the following steps to remove the lithium battery:

1. Make sure the system is powered off (see “Operation” on page 2-17).

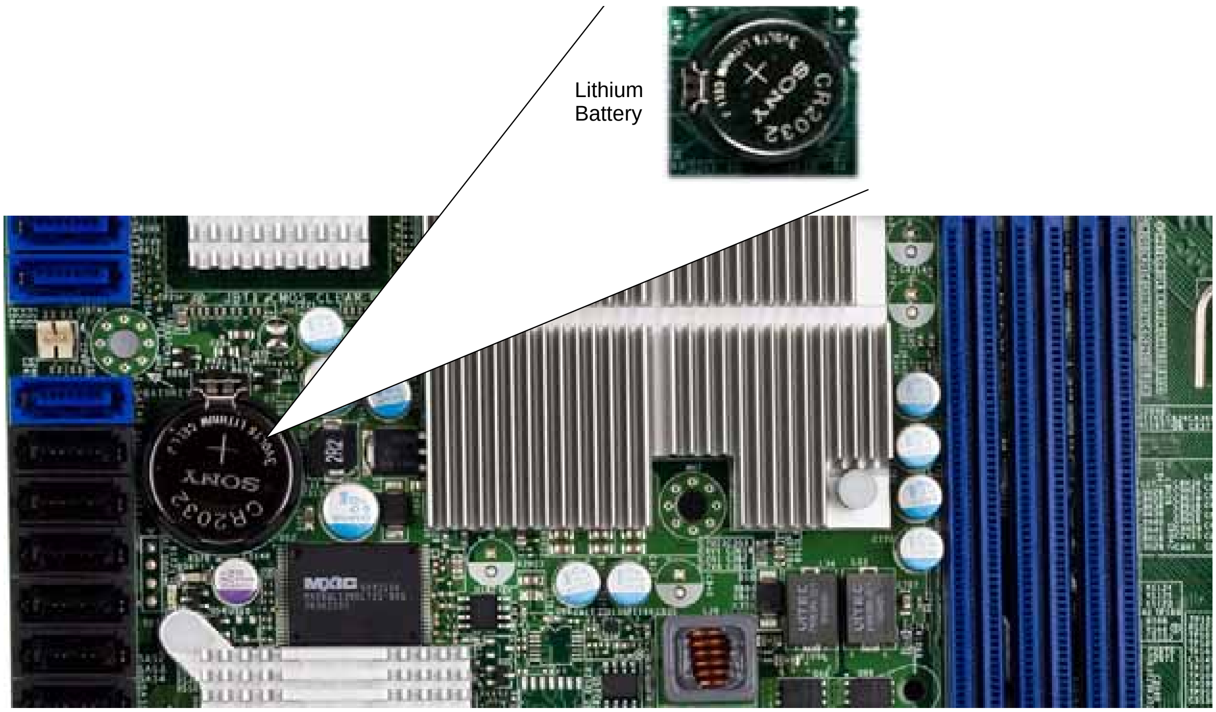
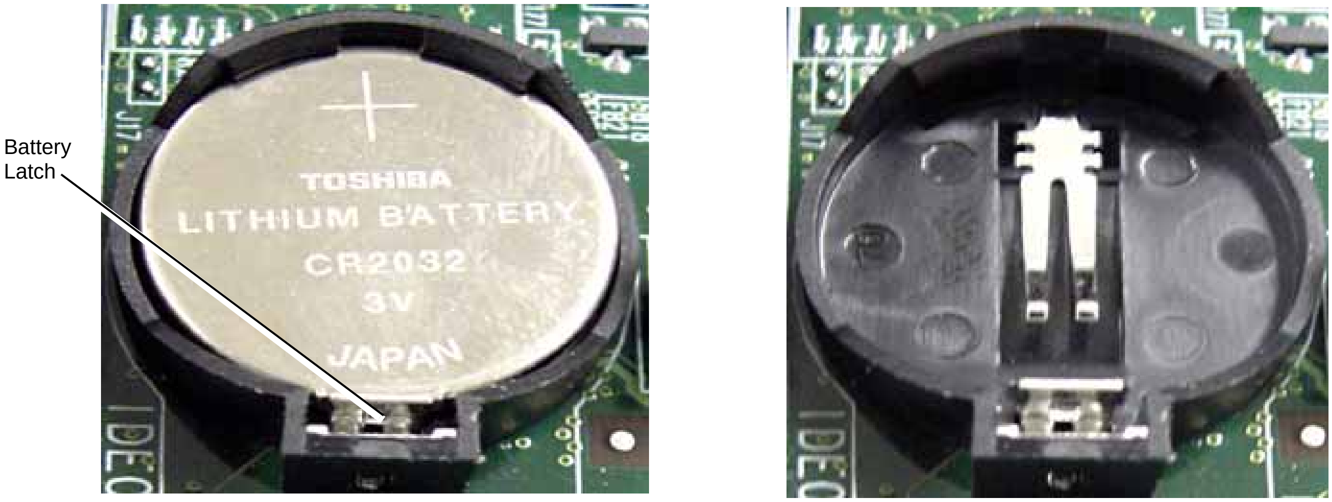


Figure 2-5. The RES-12XR3-S for X8DTL-6/-6F Lithium Battery

2. Locate the lithium battery socket and squeeze the latch (see **A**, *Figure 2-6* on page 2-9) together until the battery lifts out of its socket.

3. Remove the old battery and replace with a new battery (see next section).



A To release, squeeze the battery latch together... **B** . and remove the battery from socket

Figure 2-6. The RES-12XR3-S for X8DTL-6/-6F Lithium Battery and Socket

2.1.4.2 Installing a Lithium Battery

Perform the following steps to insert a new lithium battery:

1. Tilt the replacement battery into the empty socket so that it is angled under the battery latch (see **B**, *Figure 2-6*).
2. Carefully press down on the battery until it clicks firmly into place.

2.1.5 SAS/SATA Storage Drive

Perform the following steps to remove and install a SAS/SATA storage drive.

Note: For SATA drives, the left-hand removable storage drive (SATA ID0) is designated as the boot drive.

The front bezel (door) of the RES-12XR3-S must be unlocked and opened to access the SAS/SATA storage drives.

2.1.5.1 Opening the RES-12XR3-S for X8DTL-6/-6F Front Doors

To access the removable storage drives, you must first open the front doors (see *Fig-*

ure 2-7, page 2-10). The knurled captive screw on the front of the RES-12XR3-S allows the doors to lock without a key. To unlock the front doors, turn the screw counterclockwise and pull both bezel doors away from the chassis.

The accessory kit shipped with your RES-12XR3-S for X8DTL-6/-6F contains two barrel lock keys. This provides you the option of unlocking/locking the storage drives.

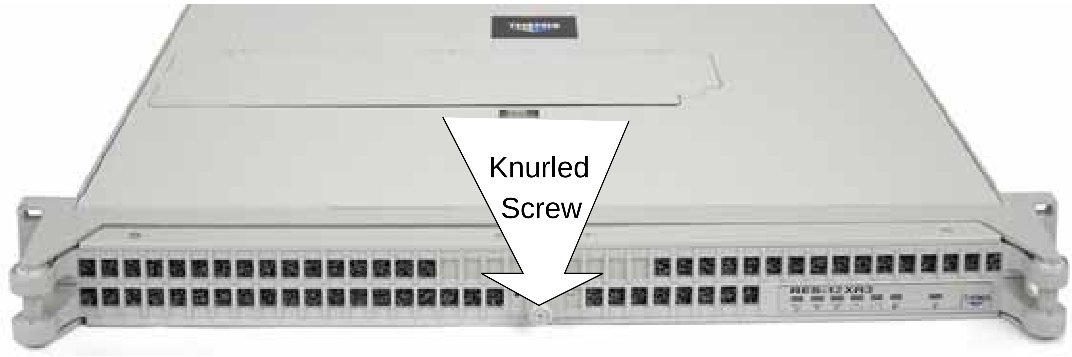

Knurled
Screw

Figure 2-7. Opening the RES-12XR3-S Front Doors

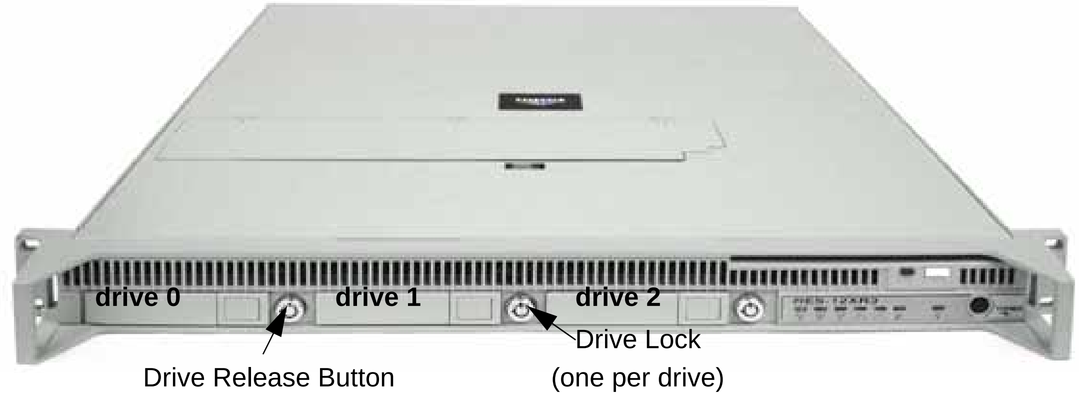

drive 0
drive 1
drive 2
Drive Lock
(one per drive)
Drive Release Button

Figure 2-8. Unlocking the RES-12XR3-S Storage Drives (Front Doors Removed)

2.1.5.2 Storage-Drive Removal

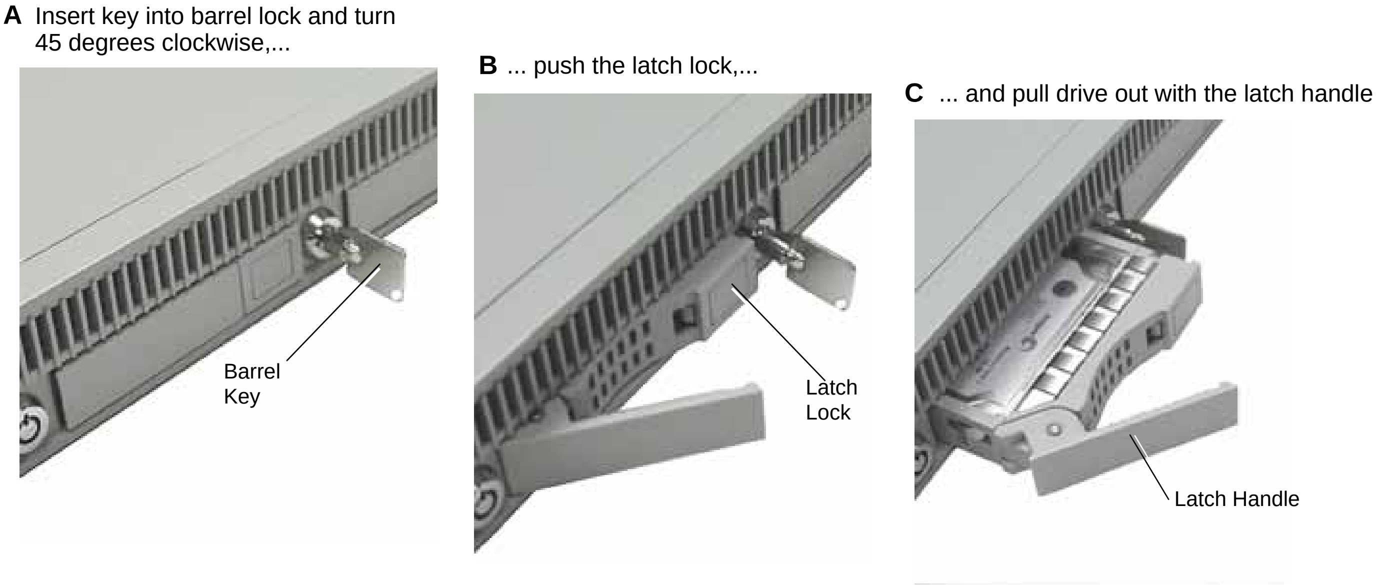
After opening the front doors, perform the following steps to remove and install a storage drive:

Note: Since RES-12XR3-S storage drives are “hot-swappable”, it is not necessary to turn off system power in order to remove and replace a drive (except the operating system drive). However, after a warning has been broadcast to all users, the drive being replaced should be dismounted before being removed.

Consult your operating system manual for specific details.

1. Make sure the necessary precautions have been observed as per the previous *Note* (see “Operation” on page 2-17).
2. Locate the drive to be removed.
3. Insert the barrel lock key into the hard drive you want to remove, and turn it 45 degrees clockwise (presuming the storage drive is locked).
4. Firmly push in the latch lock until the latch handle releases from the drive.
5. Grab the latch handle and pull the drive completely away from its slot.

Caution: When pulling the storage drive from the chassis, hold it at the bottom to prevent it from falling and damaging the drive.


A Insert key into barrel lock and turn 45 degrees clockwise,...

B ... push the latch lock,...

C ... and pull drive out with the latch handle

Figure 2-9. RES-12XR3-S Storage Drive Removal

2.1.5.3 Storage-Drive Installation

To install a storage drive,

1. Make sure the latch handle of the drive to be installed is in the open position.
2. Properly orient the new drive and insert it into the vacant drive slot. If the drive cannot be inserted into the slot, rotate it 180 degrees.
3. Push the drive toward the rear (DO NOT CLOSE the latch handle while pushing) until the drive is flush with the front of the chassis. The handle will swing closed when it comes into contact with the RES-12XR3-S chassis.
4. When the drive is fully inserted in its slot, insert the key into the barrel lock and turn it 45 degrees counter-clockwise. The drive is now locked.

Caution: When in the closed position, the latch handle secures the drive to the chassis. If the handle is closed before the drive is fully inserted, the latch mechanism may not fully engage to secure the drive.

5. If you are installing another storage drive, repeat Steps 1–4 for each additional drive.

2.1.6 Hot-Swappable 38-mm Fan

The RES-12XR3-S contains five high-speed 38-mm fans, each of which can be "hot-swapped" in the field in the event of a fan failure.

2.1.6.1 Removing and Installing a 38-mm Fan

Perform the following steps to remove and install a 38-mm fan:

> ***Note:*** Since RES-12XR3-S fans are "hot-swappable", it is not necessary to turn off system power in order to remove and replace a fan,

1. Push the fan lid lock left to unlock the fan lid (see *Figure 2-10* on page 2-14). Pull the fan lid upward exposing the five 38-mm fans.
2. Each fan is secured by a fan lock located on top of the fan. To remove a fan, push the fan lock toward the front of the fan and pull the fan directly upward (see *Figure 2-11* on page 2-14).
3. When the fan is removed, its 3-wire connector will automatically be disconnected from the chassis. Insert the replacement fan carefully into the empty fan slot until it is flush with the other fans. The 3-wire connector will automatically engage its counterpart successfully.

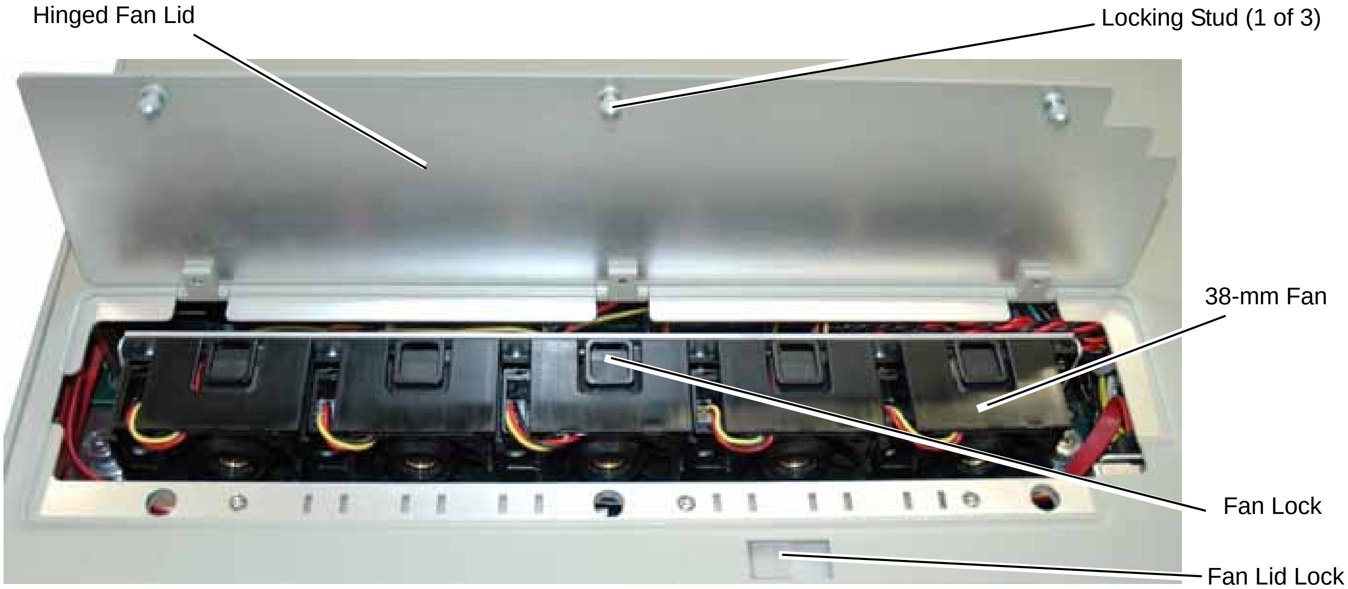

Hinged Fan Lid
Locking Stud (1 of 3)
38-mm Fan
Fan Lock
Fan Lid Lock

Figure 2-10. The RES-12XR3-S for X8DTL-6/-6F Hot-Swappable 38-mm Fans

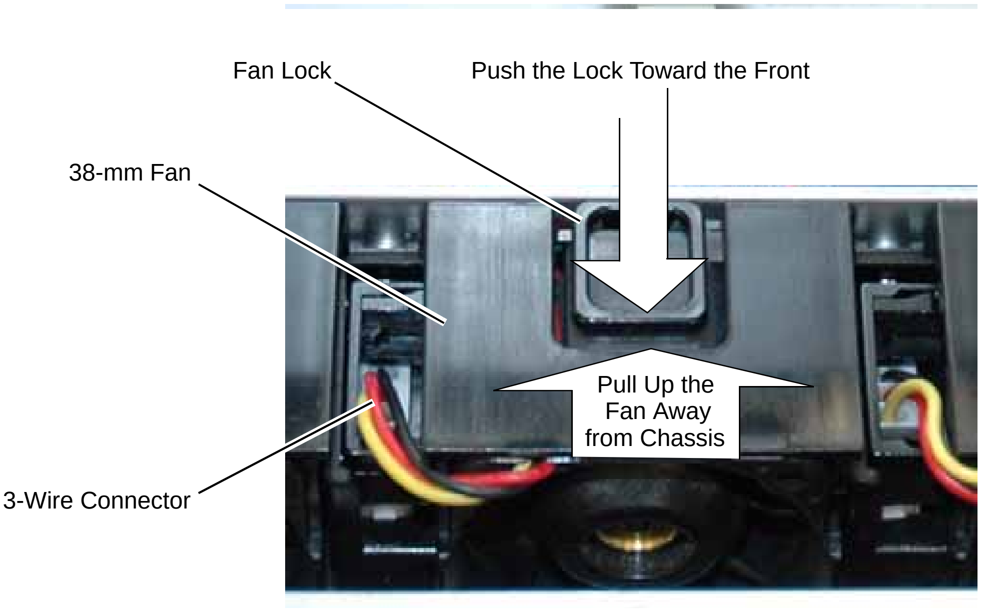

Fan Lock
Push the Lock Toward the Front
38-mm Fan
Pull Up the Fan Away from Chassis
3-Wire Connector

Figure 2-11. Removing One of the Five RES-12XR3-S 38-mm Fans

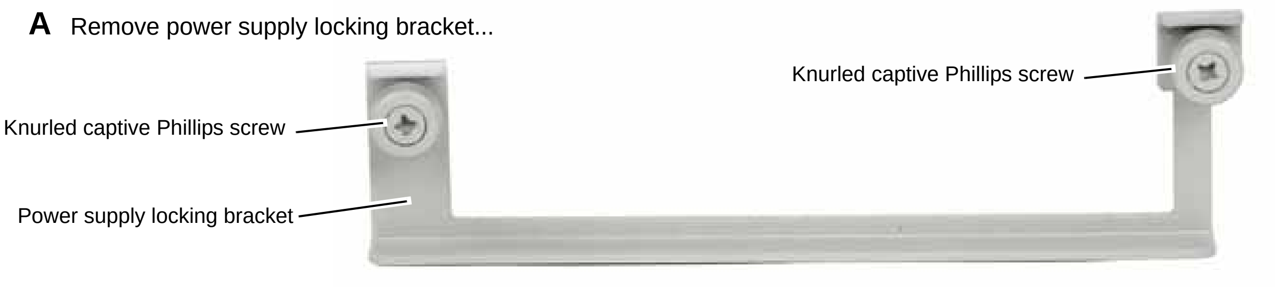
2.1.7 Power Supply

Each load-sharing (N+1 redundant) power supply can be hot-swapped while the system is still on and operational.

2.1.7.1 Removing a Power Supply

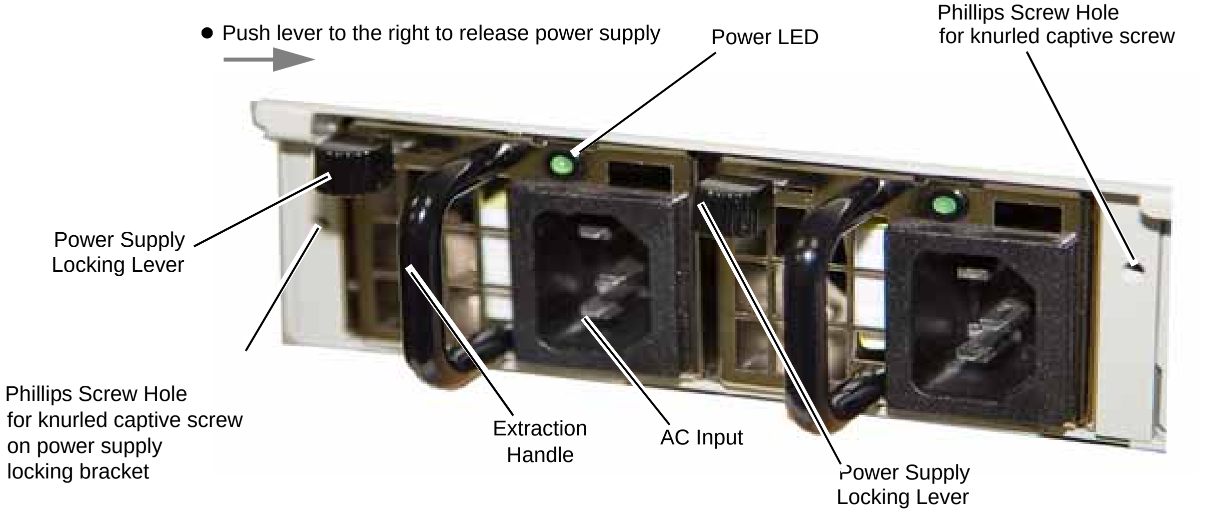
Perform the following steps to remove a power supply:

1. Loosen the two screws holding the power supply locking bracket to the chassis (see **A**, *Figure 2-12*). Place the bracket in a safe place for further use.
2. Put the right index finger on the power supply extraction handle and the right thumb on the left side of the power supply locking lever (see **B**, *Figure 2-12*).



A Remove power supply locking bracket...

Knurled captive Phillips screw
Knurled captive Phillips screw
Power supply locking bracket



B ... then push locking lever to the right and remove power supply

● Push lever to the right to release power supply
Power LED
Phillips Screw Hole for knurled captive screw
Power Supply Locking Lever
Phillips Screw Hole for knurled captive screw on power supply locking bracket
Extraction Handle
AC Input
Power Supply Locking Lever

Figure 2-12. The RES-12XR3-S for X8DTL-6/-6F Power Supply Locking Mechanism

3. Squeeze the locking lever toward the extraction handle and firmly pull the power supply from the chassis.

Caution: When pulling the power supply from the chassis, hold it at the bottom to prevent it from falling and damaging the unit.

2.1.7.2 Installing a Power Supply

Perform the following steps to install a power supply:

1. Insert the replacement power supply into an empty slot with the power LED at the top (see *Figure 2-12* on page 2-15).
2. Push the power supply carefully into its slot until it is firmly seated (a click will be heard when the locking lever is securely fastened to the chassis).
3. Replace and tighten the two captive screws to hold the power supply locking lever to the chassis (see *Figure 2-12*) to secure both power supplies.

2.2 Rack Mounts

2.2.1 Mounting Brackets

The rack-mount brackets (flanges) are used to secure the chassis to the 19” rack (see *Figure 2-13*). Handles are used to pull the RES-12XR3-S from the rack when rack-mount slides have been installed on the sides of the chassis (see following section).

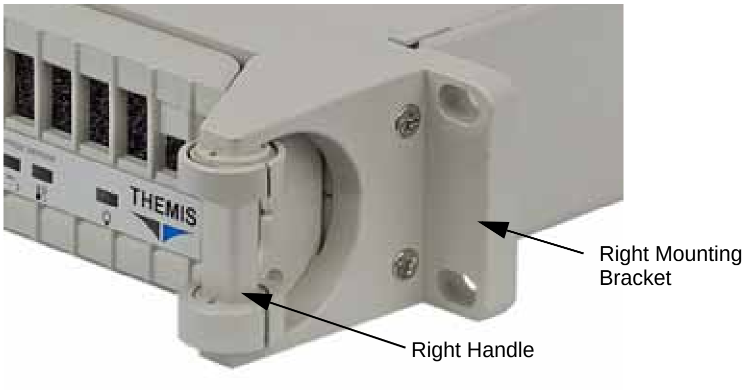


Figure 2-13. Right Rack-Mount Bracket

2.2.2 Rack-Mount Slides (Optional)

Rack-Mount Slides can be mounted on each side of the RES-12XR3-S for X8DTL-6/-6F, for the purpose of sliding the unit in and out of a rack. Mounting slides are optional and should be ordered at the time your system is purchased.

To learn how to install rack-mount slides, refer to Appendix B, "Rack-Mount Slide Installation".

Caution: Any screws used to mount a slide to a RES-12XR3-S chassis must not exceed a length of 3/8" to prevent excessive penetration of the chassis.

2.3 Operation

2.3.1 Plugging in the AC Power Cords

Before powering on the RES-12XR3-S, plug in the AC power cords as follows:

1. On the rear of the RES-12XR3-S, plug an AC power cord (shipped with unit) into the AC power socket on each power supply (see *Figure 2-14*).

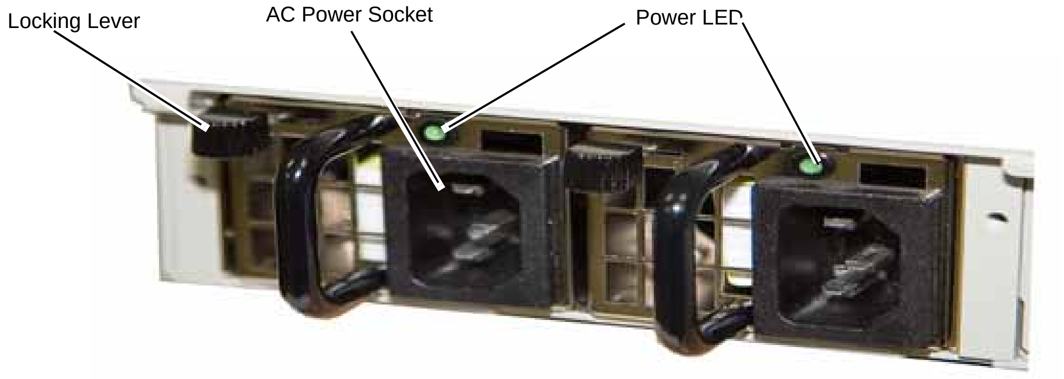


Figure 2-14. AC Power Socket and LED on the RES-12XR3-S for X8DTL-6/-6F Rear

2.3.2 Turning the System On

1. Plug the AC power cord from each of the RES-12XR3-S for X8DTL-6/-6F power supplies into a "live" AC outlet.

The LED on each power supply will turn on when AC power is enabled.

2. On the front of the RES-12XR3-S push the system power on/off button (see *Figure 2-15*). This will cause the system `POWER` LED to light (green).

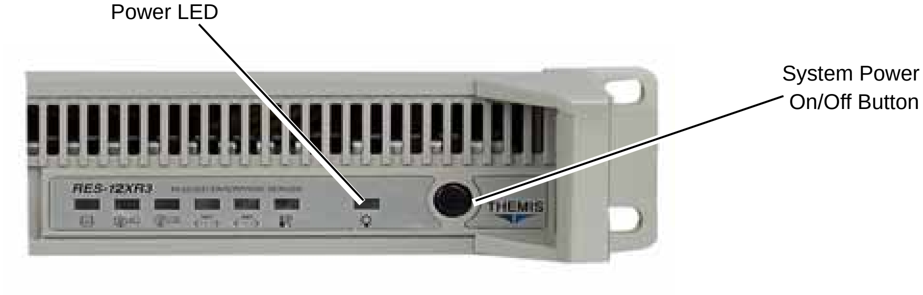


Figure 2-15. System Power Button and LED on the RES-12XR3-S for X8DTL-6/-6F Front

2.3.3 Getting Started

2.3.3.1 Configuration

1. Make sure all SAS/SATA drives are installed (see “SAS/SATA Storage Drive” on page 2-9). Drive ID numbers are shown in *Figure 2-8* on page 2-10, Chapter 2. Changes may be made through the BIOS.
2. Make sure that a graphics card is installed in a PCI slot and connect a multi-scan monitor to the VGA or DVI connector.
3. Attach a PS/2 keyboard and mouse to the appropriate connectors on the rear I/O panel of the RES-12XR3-S (see *Figure 1-5* on page 1-6)
4. Turn the system on (see previous section).

2.3.3.2 Linux Installation

The subject of installing the Linux operating system onto the RES-12XR3-S is detailed in Appendix C, “Red Hat Enterprise Linux 5 Installation”.

2.3.4 Turning the System Off

Caution: Before turning your system off, make sure to save all open files, properly close applications, and broadcast a warning to all users on any active networks.

1. To turn the RES-12XR3-S power off, press and hold the system power on/off button (see *Figure 2-15*, page 2-18) for at least four (4) seconds. This will shut down the system and turn off the `POWER` LED.

As an alternative, a modern operating system (Windows 9x or newer and Linux, for example) can turn off the system after a graceful OS software shutdown.

Installation Section

Chapter 3

BIOS Setup Utility

3.1 Introduction

This chapter describes the AMI BIOS Setup Utility for the RES-12XR3-S for X8DTL-6/-6F motherboard. The AMI ROM BIOS is stored in a Flash EEPROM and can be easily updated. This chapter describes the basic navigation of the AMI BIOS Setup Utility setup screen

3.1.1 Starting BIOS Setup Utility

To enter the AMI BIOS Setup Utility screens, press the <Delete> key while the system is booting up.

Note: In most cases, the <Delete> key is used to invoke the AMI BIOSsetup screen. There are a few cases when other keys are used, such as <F1>, <F2>, etc.

Each main BIOS menu option is described in this manual. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. Grayed-out options cannot be configured. Options in blue can be configured by the user. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

Note: The AMI BIOS has default text messages built in. Themis retains the option to include, omit, or change any of these text messages.

The AMI BIOS Setup Utility uses a key-based navigation system called “hot keys”. Most of the AMI BIOS setup utility “hot keys” can be used at any time during the setup navigation process. These keys include <F1>, <F10>, <Enter>, <ESC>, arrow keys, etc.

Note: Options printed in **Bold** are default settings.

3.1.2 How To Change the Configuration Data

The configuration data that determines the system parameters may be changed by entering the AMI BIOS Setup utility. This Setup utility can be accessed by pressing <Del> at the appropriate time during system boot.

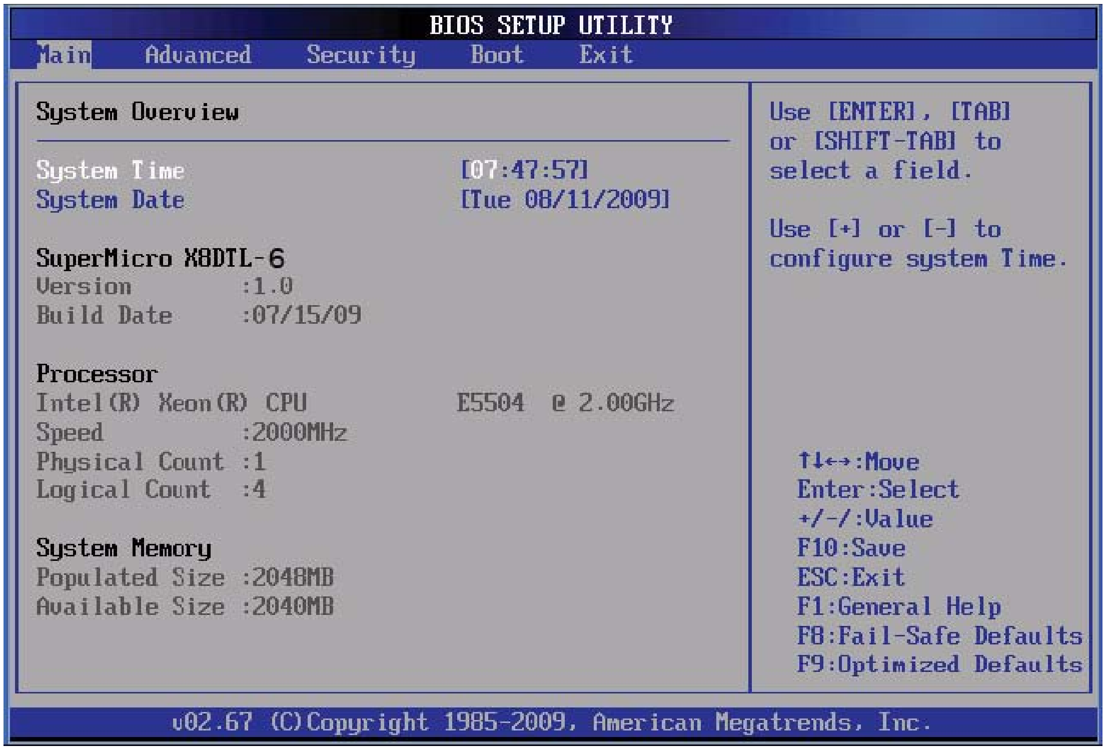
3.1.3 Starting the Setup Utility

Normally, the only visible Power-On Self-Test (POST) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the AMI BIOS Setup Utility. From the main menu, you can access the other setup screens. An AMI BIOS identification string is displayed at the left bottom corner of the screen below the copyright message.

Caution: Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. In no event shall Themis be liable for direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you have to update the BIOS, do not shut down or reset the system while the BIOS is updating. This is to avoid possible boot failure.

3.2 Main Setup

When you first enter the AMI BIOS Setup Utility, you will enter the Main setup screen.You can always return to the Main setup screen by selecting the Main tab on the top of the screen. The Main BIOS Setup screen is shown below.



```
                              BIOS SETUP UTILITY
 Main    Advanced    Security    Boot    Exit

 System Overview                                      Use [ENTER], [TAB]
                                                      or [SHIFT-TAB] to
 System Time                  [07:47:57]              select a field.
 System Date                  [Tue 08/11/2009]
                                                      Use [+] or [-] to
 SuperMicro X8DTL-6                                   configure system Time.
 Version         :1.0
 Build Date      :07/15/09

 Processor
 Intel(R) Xeon(R) CPU         E5504  @ 2.00GHz
 Speed           :2000MHz
 Physical Count  :1                                     ↑↓←→:Move
 Logical Count   :4                                     Enter:Select
                                                        +/-/:Value
 System Memory                                          F10:Save
 Populated Size  :2048MB                                ESC:Exit
 Available Size  :2040MB                                F1:General Help
                                                        F8:Fail-Safe Defaults
                                                        F9:Optimized Defaults

          v02.67 (C)Copyright 1985-2009, American Megatrends, Inc.
```

Figure 3-1. Main BIOS Setup Screen

3.2.1 System Time/System Date

Use this option to change the system time and date. Highlight *System Time* or *System Date* using the arrow keys. Key in new values through the keyboard and press <Enter>. Press the <Tab> key to move between fields. The date must be entered in Day MM/DD/YY format. The time is entered in HH:MM:SS format.

Note: The time is in the 24-hour format. For example, 5:30 P.M. appears as 17:30:00.

3.2.2 Supermicro X8DTL-6 Motherboard

- Version: This item displays the BIOS revision used in your system.
- Build Date: This item displays the date when this BIOS was completed.

3.2.3 Processor

The AMI BIOS will automatically display the status of the processor used in your system:

- CPU Type: This item displays the type of CPU used in the motherboard.
- Speed: This item displays the speed of the CPU detected by the BIOS.
- Physical Count: This item displays the number of processors installed in your system as detected by the BIOS.
- Logical Count: This item displays the number of CPU Cores installed in your system as detected by the BIOS.

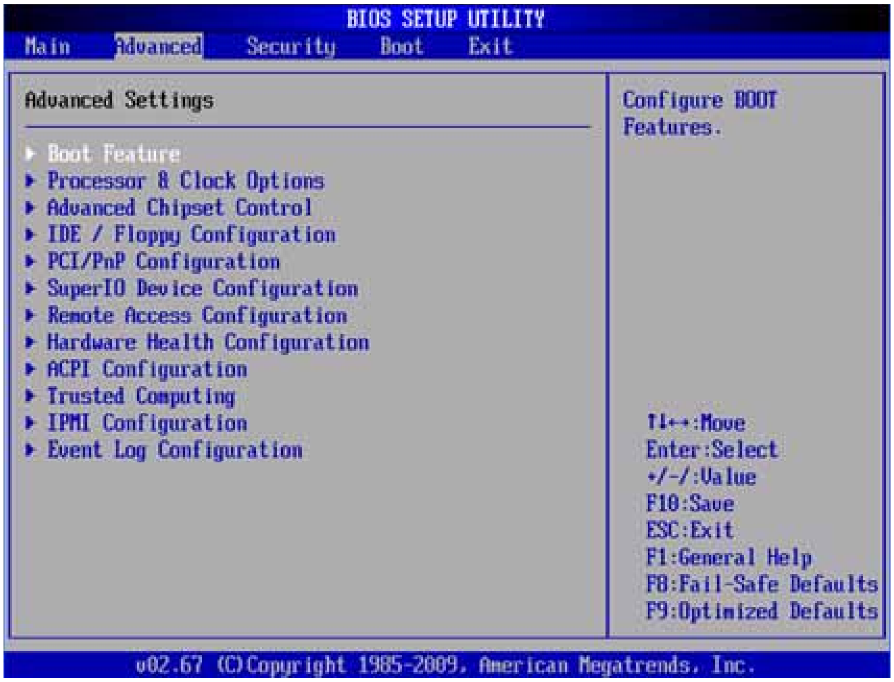
3.2.4 System Memory

This displays the size of memory available in the system:

- Populated Size: This item displays the installed memory size detected by the BIOS.
- Available Size: This item displays the available memory detected by the BIOS.

3.3 Advanced Setup Configurations

Use the arrow keys to select Advanced Setup and hit <Enter> to access the submenu items:



BIOS SETUP UTILITY
Main Advanced Security Boot Exit

Advanced Settings

- Boot Feature
- Processor & Clock Options
- Advanced Chipset Control
- IDE / Floppy Configuration
- PCI/PnP Configuration
- SuperIO Device Configuration
- Remote Access Configuration
- Hardware Health Configuration
- ACPI Configuration
- Trusted Computing
- IPMI Configuration
- Event Log Configuration

Configure BOOT Features.

↑↓←→:Move
Enter:Select
+/-/:Value
F10:Save
ESC:Exit
F1:General Help
F8:Fail-Safe Defaults
F9:Optimized Defaults

v02.67 (C)Copyright 1985-2009, American Megatrends, Inc.

Figure 3-2. Advanced Settings

3.3.1 Boot Features

3.3.1.1 Quick Boot

If Enabled, this option will skip certain tests during POST to reduce the time needed for system boot. The options are **Enabled** and Disabled.

3.3.1.2 Quiet Boot

This option allows the bootup screen options to be modified between POST messages or the OEM logo. Select Disabled to display the POST messages. Select Enabled to display the OEM logo instead of the normal POST messages. The options are **Enabled** and Disabled.

3.3.1.3 AddOn ROM Display Mode

This sets the display mode for Option ROM. Select Keep Current to use the current AddOn ROM Display setting. Select Force BIOS to use the Option ROM display mode set by the system BIOS. The options are **Force BIOS** and Keep Current.

3.3.1.4 Bootup Num-Lock

This feature selects the Power-on state for the Numlock key. The options are Off and **On**.

3.3.1.5 PS/2 Mouse Support

This feature enables support for the PS/2 mouse. The options are Disabled, Enabled, and **Auto**.

3.3.1.6 Wait For 'F1' If Error

This forces the system to wait until the 'F1' key is pressed if an error occurs. The options are Disabled and **Enabled**.

3.3.1.7 Hit 'Del' Message Display

This feature displays “Press DEL to run Setup” during POST. The options are **Enabled** and Disabled.

3.3.1.8 Watch Dog Function

If enabled, the Watch Dog Timer will allow the system to reboot when it is inactive for more than 5 minutes. The options are Enabled and **Disabled**.

3.3.1.9 Power Button Function

If set to Instant_Off, the system will power off immediately as soon as the user hits the power button. If set to 4_Secont_Override, the system will power off when the user presses the power button for 4 seconds or longer. The options are **Instant_Off** and 4_Second_Override.

3.3.1.10 Restore on AC Power Loss

Use this feature to set the power state after a power outage. Select Power-Off for the power to remain off after a power loss. Select Power-On for the power to be turned on after a power loss. Select Last State to allow the system to resume its last state before a power loss. The options are Power-On, Power-Off and **Last State**.

3.3.1.11 Interrupt 19 Capture

Interrupt 19 is the software interrupt that handles the boot drive function. When this item is set to Enabled, the ROM BIOS of the host adaptors will “capture” Interrupt 19 at boot and allow the drives that are attached to these host adaptors to function as bootable drives. If this item is set to Disabled, the ROM BIOS of the host adaptors will not capture Interrupt 19, and the drives attached to these adaptors will not function as bootable devices. The options are **Enabled** and Disabled.

3.3.2 Processor and Clock Options

This submenu allows the user to configure the Processor and Clock settings.

3.3.2.1 CPU Ratio

Select Manual to manually configure the CPU Ratio. Select Auto to allow the BIOS to automatically configure the CPU Ratio. The options are **Auto** and Manual.

Note: If an invalid ratio is entered, the AMI BIOS will restore the setting to the previous state.

3.3.2.2 Ratio CMOS Setting (Available when the item-CPU Ratio is set to Manual)

If CPU Ratio is set to Manual (above), this option allows the user to press <+> or <-> on the keyboard to set the ratio between the CPU Core Clock and the FSB Frequency. The default setting depends on the type of CPU installed on the motherboard. The default setting is **[19]**.

3.3.2.3 Clock Spread Spectrum

Select Enable to use the feature of Clock Spectrum support, which will allow the BIOS to monitor and attempt to reduce the level of Electromagnetic Interference caused by the components whenever needed. The options are **Disabled** and Enabled.

3.3.2.4 Hardware Prefetcher (Available when supported by the CPU)

If set to Enabled, the hardware prefetcher will prefetch streams of data and instructions from the main memory to the L2 cache to improve CPU performance. The options are Disabled and **Enabled**.

3.3.2.5 Adjacent Cache Line Prefetch (Available when supported by the CPU)

The CPU fetches the cache line for 64 bytes if this option is set to Disabled. The CPU fetches both cache lines for 128 bytes as comprised if Enabled. The options are Disabled and **Enabled**.

3.3.2.6 MPS and ACPI Ordering

This feature allows the user to configure the MPS (Multi-Processor Specifications) and ACPI settings for your motherboard. Select Modern Ordering if XP or a newer version of Windows OS is used in the motherboard. Select Legacy Ordering if the 2000 or an earlier version of Windows OS is used. The options are **Modern Ordering** and Legacy Ordering.

3.3.2.7 Intel® Virtualization Technology (Available when supported by the CPU)

Select Enabled to enable Virtualization Technology support to allow one platform to run multiple operating systems and applications in independent partitions, creating multiple “virtual” systems in one physical computer. The options are Enabled and **Disabled**.

> ***Note:*** If there is any change to this setting, you will need to power off and restart the system for the change to take effect. Please refer to Intel’s website for detailed information.

3.3.2.8 Execute-Disable Bit Capability (Available when supported by the OS and the CPU)

Select Enabled to enable the Execute_Disable_Bit support which will allow the processor to designate areas in the system memory where an application code can execute and where it cannot, thus preventing a worm or a virus from flooding illegal codes to overwhelm the processor or damage the system during an attack. The default is **Enabled**. (Refer to Intel and Microsoft Web Sites for more information.)

3.3.2.9 Simultaneous Multi-Threading (Available when supported by the CPU)

Set to Enabled to use the Simultaneous Multi-Threading Technology, which will result in increased CPU performance. The options are Disabled and **Enabled**.

3.3.2.10 Active Processor Cores

Set to Enabled to use a processor's Second Core and beyond. (Please refer to Intel's web site for more information.) The options are **All,** 1 and 2.

3.3.2.11 Intel® EIST Technology

EIST (Enhanced Intel SpeedStep Technology) allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. (Please refer to Intel’s web site for detailed information.) The options are Disabled and **Enabled**.

3.3.2.12 Intel® TurboBoost Technology (Available when EIST Technology is enabled)

Select Enabled to enable Turbo Mode support to boost system performance. The options are **Enabled** and Disabled.

3.3.2.13 C1E Support

Select Enabled to use the feature of Enhanced Halt State. C1E significantly reduces the CPU's power consumption by reducing the CPU's clock cycle and voltage during a “Halt State.” The options are Disabled and **Enabled**.

3.3.2.14 Intel® C-STATE Tech

If enabled, C-State is set by the system automatically to either C2, C3 or C4 state. The options are Disabled and **Enabled**.

3.3.2.15 C-State Package Limit Setting (Available when Intel® C-State Tech is enabled)

If set to Auto, the AMI BIOS will automatically set the limit on the C-State package register. The options are **Auto**, C1, C3, C6 and C7.

3.3.2.16 C1 Auto Demotion (Available when the C-State Tech is enabled)

When enabled, the CPU will conditionally demote C3, C6 or C7 requests to C1 based on un-core auto-demote information. The options are Disabled and **Enabled**.

3.3.2.17 C3 Auto Demotion (Available when the C-State Tech is enabled)

When enabled, the CPU will conditionally demote C6 or C7 requests to C3 based on un-core auto-demote information. The options are Disabled and **Enabled**.

3.3.2.18 ACPI T State

Select enabled to report CPU throttling state in ACPI. The options are Enabled and **Disabled**.

3.3.2.19 DCA Technology

This feature accelerates the performance of TOE devices. For this motherboard, the TOE device is built inside the Intel South Bridge chip. This feature is supported only by some types of processors. The options are **Enabled** and Disabled.

Note: A TOE device is a specialized, dedicated processor that is installed on an add-on card or a network card to handle some or all packet processing of this add-on card.

3.3.2.20 DCA Prefetch Delay

A DCA Prefetcher is used with TOE components to prefetch data in order to shorten execution cycles and maximize data processing efficiency. Prefetching too frequently can saturate the cache directory and delay necessary cache accesses. This feature reduces or increases the frequency the system prefetches data. The options are [8], [16], **[32]**, [40], [48], [56], [64], [72], [80], [88], [96], [104], [112], [120]

3.3.3 Advanced Chipset Control

The items included in the Advanced Settings submenu are listed below:

QPI & IMC Configuration

3.3.3.1 QPI Links Speed

This feature selects QPI's data transfer speed. The options are Slow-mode, and **Full Speed**.

3.3.3.2 QPI Frequency (Available when QPI Links Speed is set to Full Speed)

This selects the desired QPI frequency. The options are **Auto**, 4.800 GT, 5.866GT, 6.400 GT.

3.3.3.3 QPI L0s and L1

This enables the QPI power state to low power. L0s and L1 are automatically selected by the motherboard. The options are **Disabled** and Enabled.

3.3.3.4 Memory Frequency

This feature forces a DDR3 frequency slower than what the system has detected. The available options are **Auto**, Force DDR-800, Force DDR-1066, and Force DDR-1333.

3.3.3.5 Memory Mode

The options are **Independent**, Channel Mirror, and Lockstep.and Sparing.

- *Independent* - All DIMMs are available to the operating system.
- *Channel Mirror* - The motherboard maintains two identical copies of all data in memory for redundancy.
- *Lockstep* - The motherboard uses two areas of memory to run the same set of operations in parallel.

3.3.3.6 Demand Scrubbing

A memory error-correction scheme where the Processor writes corrected data back into the memory block from where it was read by the Processor. The options are Enabled and **Disabled**.

3.3.3.7 Patrol Scrubbing

A memory error-correction scheme that works in the background looking for and correcting resident errors. The options are Enabled and **Disabled**.

3.3.3.8 Channel Interleave/Bank Interleave

This item allows the user to set memory interleave schemes for onboard memory channels or banks. The options for Channel Interleaving are 1 Way, 2 Way, 3 Way, 4 Way, and **6 Way.** The options for Bank Interleaving are 1 Way, 2 Way, 3 Way, **4 Way.**

3.3.3.9 Throttling - Closed Loop / Throttling - Open Loop

Throttling improves reliability and reduces power in the processor by automatic voltage control during processor idle states. Available options are **Disabled** and Enabled. If Enabled, the following items will appear:

Hysteresis Temperature (Closed Loop only)

Temperature Hysteresis is the temperature lag (in degrees Celsius) after the set DIMM temperature threshold is reached before Closed Loop Throttling begins. The options are **Disabled**, 1.5°C, 3.0°C, and 6.0°C.

Guardband Temperature (Closed Loop only)

This is the temperature which applies to the DIMM temperature threshold. Each step is in 0.5°C increment. The default is **[006]**. Press “+” or “-” on your keyboard to change this value.

Inlet Temperature (Closed Loop/Open Loop)

This is the temperature detected at the chassis inlet. Each step is in 0.5°C increment. The default is **[070]**. Press “+” or “-” on your keyboard to change this value.

Temperature Rise (Closed Loop/Open Loop)

This is the temperature rise to the DIMM thermal zone. Each step is in 0.5°C increment. The default is **[020]**. Press “+” or “-” on your keyboard to change this value.

Air Flow (Closed Loop/Open Loop)

This is the air flow speed to the DIMM modules. Each step is one mm/sec. The default is **[1500]**. Press “+” or “-” on your keyboard to change this value.

Altitude (Closed Loop/Open Loop)

This feature defines how many meters above or below sea level the system is located. Options are **Sea Level or Below,** 1~300, 301~600, 601~900, 901~1200, 1201~1500, 1501~1800, 1801~2100, 2101~2400, 2401~2700, and 2701~3000.

DIMM Pitch (Closed Loop/Open Loop)

This is the physical space between each DIMM module. Each step is in 1/1000 of an inch. The default is **[400]**. Press “+” or “-” on your keyboard to change this value.

3.3.3.10 Intel VT-d

Select Enabled to enable Intel's Virtualization Technology support for Direct I/O VT-d by reporting the I/O device assignments to VMM through the DMAR ACPI Tables. This feature offers fully-protected I/O resource-sharing across the Intel platforms, providing the user with greater reliability, security and availability in networking and data-sharing. The settings are Enabled and **Disabled**.

3.3.3.11 SR-IOV Support

Single Root I/O Virtualization is an industry-standard mechanism that allow devices to advertise their capability to be simultaneously shared among several virtual machines. SR-IOV is capable of partitioning a PCI function into several virtual interfaces for sharing the resources of a PCI Express (PCI-E) device under a virtual environment. The options are **Disabled** and Enabled.

3.3.3.12 NUMA Support

Select Enabled to use the feature of Non-Uniform Memory Access to improve CPU performance. The options are Enabled and **Disabled** and NUMA for SLES 11.

3.3.3.13 Intel I/OAT

The Intel I/OAT (I/O Acceleration Technology) significantly reduces CPU overhead by leveraging CPU architectural improvements, freeing resources for other tasks. The options are Disabled and **Enabled**.

3.3.3.14 Active State Power Management

Select Enabled to start Active-State Power Management for signal transactions between L0 and L1 Links on the PCI Express Bus. This maximizes power-saving and transaction speed. The options are Enabled and **Disabled**.

3.3.3.15 USB Functions

This feature allows the user to decide the number of onboard USB ports to be enabled. The Options are: Disabled, 2 USB ports, 4 USB ports, 6 USB ports, 8 USB ports, 10 USB ports and **12 USB ports**.

3.3.3.16 USB 2.0 Controller

Select Enabled to activate the onboard USB 2.0 controller. The options are **Enabled** and Disabled. (The options are not selectable unless the item above- USB Functions is set to Disabled.)

3.3.3.17 Legacy USB Support

Select Enabled to use Legacy USB devices. If this item is set to Auto, Legacy USB support will be automatically enabled if a legacy USB device is installed on the motherboard, and vise versa. The settings are Disabled, Enabled and **Auto**.

3.3.4 IDE/SATA Configuration

When this submenu is selected, the AMI BIOS automatically detects the presence of the IDE devices and displays the following items:

3.3.4.1 SATA#1 Configuration

If Compatible is selected, it sets SATA#1 to legacy compatibility mode, while selecting Enhanced sets SATA#1 to native SATA mode. The options are Disabled, Compatible and **Enhanced**.

Configure SATA#1

This feature allows the user to select the drive type for SATA#1. The options are **IDE**, RAID and AHCI. (When the option-RAID is selected, the item “ICH RAID Code Base” will appear.)

ICH RAID Code Base (This feature is available when the option-RAID is selected)

Select Intel to enable Intel's SATA RAID firmware to configure Intel's SATA RAID settings. Select Adaptec to enable Adaptec's SATA RAID firmware to configure Adaptec's SATA RAID settings. The options are **Intel** and Adaptec.

SATA#2 Configuration (This feature is available when the option-IDE is selected for SATA#1)

Selecting Enhanced will set SATA#2 to native SATA mode. The options are Disabled, and **Enhanced**.

3.3.4.2 IDE Detect Timeout (sec)

Use this feature to set the time-out value for the BIOS to detect the ATA, ATAPI devices installed in the system. The options are 0 (sec.), 5, 10, 15, 20, 25, 30, and **35**.

3.3.4.3 Primary IDE Master/Slave, Secondary IDE Master/Slave, Third IDE Master, and Fourth IDE Master

These settings allow the user to set the parameters of Primary IDE Master/Slave, Secondary IDE Master/Slave, Third and Fourth IDE Master slots. Hit <Enter> to activate the following submenu screen for detailed options of these items. Set the correct configurations accordingly. The items included in the submenu are:

Type

Select the type of device connected to the system. The options are Not Installed, **Auto**, CD/DVD and ARMD.

LBA/Large Mode

LBA (Logical Block Addressing) is a method of addressing data on a storage drive. In the LBA mode, the maximum drive capacity is 137 GB. For drive capacities over 137 GB, your system must be equipped with a 48-bit LBA mode addressing. If not, contact your manufacturer or install an ATA/133 IDE controller card that supports 48-bit LBA mode. The options are Disabled and **Auto**.

Block (Multi-Sector Transfer)

Block Mode boosts the IDE drive performance by increasing the amount of data transferred. Only 512 bytes of data can be transferred per interrupt if Block Mode is not used. Block Mode allows transfers of up to 64 KB per interrupt. Select Disabled to allow data to be transferred from and to the device one sector at a time. Select Auto to allow data transfer from and to the device to occur multiple sectors at a time if the device supports it. The options are **Auto** and Disabled.

PIO Mode

The IDE PIO (Programmable I/O) Mode programs timing cycles between the IDE drive and the programmable IDE controller. As the PIO mode increases, the cycle time decreases. The options are **Auto** 0, 1, 2, 3, and 4.

Select Auto to allow the AMI BIOS to automatically detect the PIO mode. Use this value if the IDE storage drive support cannot be determined.

Select 0 to allow the AMI BIOS to use PIO mode 0. It has a data transfer rate of 3.3 MBs.

Select 1 to allow the AMI BIOS to use PIO mode 1. It has a data transfer rate of 5.2 MBs.

Select 2 to allow the AMI BIOS to use PIO mode 2. It has a data transfer rate of 8.3 MBs.

Select 3 to allow the AMI BIOS to use PIO mode 3. It has a data transfer rate of 11.1 MBs.

Select 4 to allow the AMI BIOS to use PIO mode 4. It has a data transfer bandwidth of 32-Bits. Select Enabled to enable 32-Bit data transfer.

DMA Mode

Select Auto to allow the BIOS to automatically detect IDE DMA mode when the IDE storage drive support cannot be determined.

Select SWDMA0 to allow the BIOS to use Single Word DMA mode 0. It has a data transfer rate of 2.1 MBs.

Select SWDMA1 to allow the BIOS to use Single Word DMA mode 1. It has a data transfer rate of 4.2 MBs.

Select SWDMA2 to allow the BIOS to use Single Word DMA mode 2. It has a data transfer rate of 8.3 MBs.

Select MWDMA0 to allow the BIOS to use Multi Word DMA mode 0. It has a data transfer rate of 4.2 MBs.

Select MWDMA1 to allow the BIOS to use Multi Word DMA mode 1. It has a data transfer rate of 13.3 MBs.

Select MWDMA2 to allow the BIOS to use Multi-Word DMA mode 2. It has a data transfer rate of 16.6 MBs.

Select UDMA0 to allow the BIOS to use Ultra DMA mode 0. It has a data transfer rate of 16.6 MBs. It has the same transfer rate as PIO mode 4 and Multi Word DMA mode 2.

Select UDMA1 to allow the BIOS to use Ultra DMA mode 1. It has a data transfer rate of 25 MBs.

Select UDMA2 to allow the BIOS to use Ultra DMA mode 2. It has a data transfer rate of 33.3 MBs.

Select UDMA3 to allow the BIOS to use Ultra DMA mode 3. It has a data transfer rate of 66.6 MBs.

Select UDMA4 to allow the BIOS to use Ultra DMA mode 4. It has a data transfer rate of 100 MBs.

Select UDMA5 to allow the BIOS to use Ultra DMA mode 5. It has a data transfer rate of 133 MBs.

Select UDMA6 to allow the BIOS to use Ultra DMA mode 6. It has a data transfer rate of 133 MBs. The options are **Auto**, SWDMAn, MWDMAn, and UDMAn.

S.M.A.R.T. For Storage drives

Self-Monitoring Analysis and Reporting Technology (SMART) can help predict impending drive failures. Select Auto to allow the AMI BIOS to automatically detect storage drive support. Select Disabled to prevent the AMI BIOS from using the S.M.A.R.T. Select Enabled to allow the AMI BIOS to use the S.M.A.R.T. to support storage drive condition. The options are Disabled, Enabled, and **Auto**.

32-Bit Data Transfer

Select Enable to enable the function of 32-bit IDE data transfer. The options are **Enabled** and Disabled.

3.3.5 PCI/PnP Configuration

3.3.5.1 Clear NVRAM

This feature clears the NVRAM during system boot. The options are **No** and Yes.

3.3.5.2 Plug & Play OS

Selecting Yes allows the OS to configure Plug & Play devices. (This is not required for system boot if your system has an OS that supports Plug & Play.) Select **No** to allow the AMI BIOS to configure all devices in the system.

3.3.5.3 PCI Latency Timer

This feature sets the latency Timer of each PCI device installed on a PCI bus. Select 64 to set the PCI latency to 64 PCI clock cycles. The options are 32, **64**, 96, 128, 160, 192, 224 and 248.

3.3.5.4 PCI IDE BusMaster

When enabled, the BIOS uses PCI bus mastering for reading/writing to IDE drives. The options are Disabled and **Enabled**.

3.3.5.5 PCI-Express I/O Performance

Some add-on cards perform faster with the coalesce feature, which limits the payload size to 128B; while others, with a payload size of 256B by disabling coalesce support. Please refer to your add-on card user guide for the desired setting. The options are 128B and 256B.

3.3.5.6 ROM Scan Ordering

This item determines what kind of option ROM to be activated over another. The options are **Onboard First** and Add-on First.

3.3.5.7 Slot 1 PCI 33MHz, Slot 2 PCI 33MHz, Slot 3 PCIE x4 1.0 in X8 Slot, Slot 4 PCIE 2.0 x4 in x8 Slot, Slot 5 PCIE x4 in x8 Slot, Slot 6 PCIE x8 in x16 Slot

This feature allows you to Enable or Disable any of the PCI slots. The options are **Enable** and Disable.

3.3.5.8 Onboard LAN Option ROM Select

Select the onboard LAN option ROM type. The options are iSCSI and **PXE**.

3.3.5.9 Load Onboard LAN1 Option ROM/Load Onboard LAN2 Option ROM

Select Enabled to enable the onboard LAN1 or LAN2 Option ROM. This is to boot computer using a network interface. The options are Enabled and **Disabled**.

3.3.5.10 Load Onboard SAS Option ROM

Select Enabled to enable Onboard SAS Option ROM. This is to boot the computer using a network interface. The options are **Enabled** and Disabled.

3.3.5.11 Boot Graphics Adapter Priority

This feature allows the user to specify which graphics controller to be used as the primary boot device. The options are **Onboard VGA** and other**.**

3.3.6 Super IO Device Configuration

3.3.6.1 Serial Port1 Address/Serial Port2 Address

This option specifies the base I/O port address and the Interrupt Request address of Serial Port 1 and Serial Port 2. Select Disabled to prevent the serial port from accessing any system resources. When this option is set to Disabled, the serial port physically becomes unavailable.The options for Serial Port1 are Disabled, 2F8/IRQ3, 3F8/IRQ4, 3E8/IRQ4, 2E8/IRQ3. The options for Serial Port2 are Disabled, 2F8/IRQ3, 3E8/IRQ4, 2E8/IRQ3 and 3F8/IRQ4.

Serial Port 2 Attribute

This feature allows the user to set the mode for Serial Port 2 as a normal serial port or a virtual COM port for Serial-Over-LAN (SOL). The options are **SOL** and. COM

3.3.7 Remote Access Configuration

3.3.7.1 Remote Access

This allows the user to enable the Remote Access feature. The options are **Enabled** and Disabled.

If Remote Access is set to Enabled, the following items will display:

3.3.7.2 Serial Port Number

This feature allows the user to decide which serial port to be used for Console Redirection. The options are **COM 1** and COM 2. (When BMC is present, COM2 will be enabled for SOL.)

Base Address, IRQ

This item displays the based address and IRQ of the serial port specified above. The default setting is 3F8h, 4.

3.3.7.3 Serial Port Mode

This feature allows the user to set the serial port mode for Console Redirection. The options are **115200 8, n 1**; 57600 8, n, 1; 38400 8, n, 1; 19200 8, n, 1; and 9600 8, n, 1.

3.3.7.4 Flow Control

This feature allows the user to set the flow control for Console Redirection. The options are **None**, Hardware, and Software.

3.3.7.5 Redirection After BIOS POST

Select Disabled to turn off Console Redirection after Power-On Self-Test (POST). Select Always to keep Console Redirection active all the time after POST.

✓ ***Note:*** This setting may not be supported by some operating systems.

Select Boot Loader to keep Console Redirection active during POST and Boot

Loader. The options are Disabled, Boot Loader, and **Always**.

3.3.7.6 Terminal Type

This feature allows the user to select the target terminal type for Console Redirection. The options are **ANSI**, VT100, and VT-UTF8.

3.3.7.7 VT-UTF8 Combo Key Support

A terminal keyboard definition that provides a way to send commands from a remote console. Available options are **Enabled** and Disabled.

3.3.7.8 Sredir Memory Display Delay

This feature defines the length of time in seconds to display memory information. The options are **No Delay**, Delay 1 Sec., Delay 2 Sec., and Delay 4 Sec.

3.3.8 Hardware Health Monitor

This feature allows the user to monitor system health and review the status of each item as displayed.

3.3.8.1 CPU Overheat Alarm

This option allows the user to select the CPU Overheat Alarm setting which determines when the CPU OH alarm will be activated to provide warning of possible CPU overheat.

Caution: **1.** Any temperature that exceeds the CPU threshold temperature predefined by the CPU manufacturer may result in CPU overheat or system instability. When the CPU temperature reaches this predefined threshold, the CPU and system cooling fans will run at full speed.
2. To avoid possible system overheating, please be sure to provide adequate airflow to your system.

The options are:

- The Early Alarm: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered as soon as the CPU temperature reaches the CPU overheat threshold as predefined by the CPU manufacturer.

- **The Default Alarm**: Select this setting if you want the CPU overheat alarm (including the LED and the buzzer) to be triggered when the CPU temperature reaches about $5^{o}C$ above the threshold temperature as predefined by the CPU manufacturer to give the CPU and system fans additional time needed for CPU and system cooling. In both the alarms above, please take immediate action as shown below.

3.3.8.2 CPU 1 Temperature/CPU 2 Temperature/System Temperature

This feature displays current temperature readings for the CPUs and the System. The following items will be displayed for your reference only:

CPU 1 Temperature/ CPU 2 Temperature

The CPU Temperature feature will display the CPU temperature status as detected by the BIOS:

- **Low –** This level is considered as the ‘normal’ operating state. The CPU temperature is well below the CPU ‘Temperature Tolerance’. The motherboard fans and CPU will run normally as configured in the BIOS (Fan Speed Control). User intervention: No action required.
- **Medium –** The processor is running warmer. This is a ‘precautionary’ level and generally means that there may be factors contributing to this condition, but the CPU is still within its normal operating state and below the CPU ‘Temperature Tolerance’. The motherboard fans and CPU will run normally as configured in the BIOS. The fans may adjust to a faster speed depending on the Fan Speed Control settings. User intervention: No action is required. However, consider checking the fans and the chassis ventilation for blockage.
- **High –** The processor is running hot. This is a ‘caution’ level since the CPU’s ‘Temperature Tolerance’ has been reached (or has been exceeded) and may activate an overheat alarm. The system may shut down if it continues for a long period to prevent damage to the CPU.

User intervention: If the system buzzer and Overheat LED has activated, take action immediately by checking the system fans, chassis ventilation and room temperature to correct any problems.

Notes:

1. The CPU thermal technology that reports absolute temperatures (Celsius/Fahrenheit) has been upgraded to a more advanced feature by Intel in its newer processors. The basic concept is each CPU is embedded with unique

temperature information that the motherboard can read. This ‘Temperature Threshold’ or ‘Temperature Tolerance’ has been assigned at the factory and is the baseline on which the motherboard takes action during different CPU temperature conditions (i.e., by increasing Fan speed, triggering the Overheat Alarm, etc.). Since CPUs can have different ‘Temperature Tolerances’, the installed CPU can now send information to the motherboard what its ‘Temperature Tolerance’ is, and not the other way around. This results in better CPU thermal management.

Supermicro has leveraged this feature by assigning a temperature status to certain thermal conditions in the processor (Low, Medium and High). This makes it easier for the user to understand the CPU’s temperature status, rather than by just simply seeing a temperature reading (i.e., 25°C). The information provided above is for your reference only. For more information on thermal management, please refer to Intel’s Web site at www.Intel.com.

2. To avoid possible system overheating, please provide adequate airflow to the system.

System Temperature:

The system temperature will be displayed (in degrees in Celsius and Fahrenheit) as it is detected by the BIOS.

Fan Speed Readings

This feature displays the fan speed readings from Fan1 through Fan8.

Fan Speed Control Modes

This feature allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase for effective system cooling. Select “Full Speed/FS” to allow the onboard fans to run at full speed for maximum cooling. The FS setting is recommended for special system configuration or debugging. Select “Performance/PF” for better system cooling. The PF setting is recommended for high-power-consuming and high-density systems. Select “Balanced/BL” for the onboard fans to run at a speed that will balance the needs between system cooling and power saving. The BL setting is recommended for regular systems with normal hardware configurations. Select “Energy Saving/ES” for best power efficiency and maximum quietness. The Options are: Full Speed/FS, Performance/PF, Balanced/BL, and **Energy Saving/ES**.

3.3.8.3 Voltage Readings

The following voltage readings will be displayed.

CPU1 Vcore, CPU2 Vcore, 1.5V, 5V, 5VSB, 12V, -12V, 3.3Vcc, 3.3Vsb, and VBAT and Vtt.

3.3.9 ACPI Configuration

Use this feature to configure Advanced Configuration and Power Interface (ACPI) power management settings for your system.

3.3.9.1 High Performance Event Timer

Select Enabled to activate the High Performance Event Timer (HPET) that produces periodic interrupts at a much higher frequency than a Real-time Clock (RTC) does in synchronizing multimedia streams, providing smooth playback and reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in the CPU. The High Performance Event Timer is used to replace the 8254 Programmable Interval Timer. The options are **Enabled** and Disabled.

3.3.9.2 PS2 KB/MS Wake Up

Select Enable to “wake-up” the system using either the PS2 keyboard or mouse (if equipped) when the system is in S3 (Sleep) or S4 (Hibernate) State. The options are Enabled and **Disabled**.

3.3.9.3 ACPI Aware O/S

Enable ACPI support if it is supported by the OS to control ACPI through the Operating System. Otherwise, disable this feature. The options are **Yes** and No.

S3 (STR) - The CPU has no power and the power supply goes on reduced power mode. However, main memory (RAM) is still powered.

3.3.9.4 ACPI APIC Support

Select Enabled to include the ACPI APIC Table Pointer in the RSDT (Root System Description Table) pointer list. The options are **Enabled** and Disabled.

3.3.9.5 APIC ACPI SCI IRQ

When this item is set to Enabled, APIC ACPI SCI IRQ is supported by the system. The options are Enabled and **Disabled**.

3.3.9.6 Headless Mode

This feature is used to enable the system to function without a keyboard, monitor and/or mouse attached The options are Enabled and **Disabled**.

3.3.9.7 ACPI Version Features

Use this feature to select the appropriate ACPI Version for your system to ensure that the correct RSDP (Root System Description Pointer) Table is used by the system.The options are ACPI v1.0, ACPI v2.0 and ACPI v3.0. Please refer to ACPI's website for further explanation: http://www.acpi.info/.

3.3.10 Trusted Computing

3.3.10.1 TCG/TPM (Trusted Platform Module) Support

Select Yes on this item and enable the TPM jumper on the motherboard to enable TCG (TPM 1.1/1.2)/TPM support in order to improve data integrity and network security. The options are **No** and Yes. If this feature is set to Yes, the following items will display:

Indicate Physical

Select Yes for a TPM device to be detected by the system at each system boot. The options are Yes and **No**.

TPM Deactivated

Select Set to activate a TPM device at bootup. Select Clear to deactivate a TPM device. The options are Set, Clear and **Don't Change**.

TPM Owner

Select Enable Install to set up a TPM ownership. Select Clear to void a TPM ownership. Select Disable Install to disable TPM ownership setup support. The options are

Don't Change, Enable Install, Disable Install and Clear.

Execute TPM Command

Select Enabled to allow the user to change executable TPM commands and TPM settings. Select Don't Change to keep the current TPM settings. The options are **Don't Change**, Enabled, and Disabled.

- **Clearing the TPM**

  This item allows the user to clear the current TPM status.

- **TPM Enable/Disable Status**

  This item displays the status of TPM Enabled/Disabled state.

- **TPM Owner Status**

  This item displays the status of TPM Ownership

3.3.11 IPMI Configuration

Intelligent Platform Management Interface (IPMI) is a set of common interfaces that IT administrators can use to monitor system health and to manage the system as a whole. For more information on the IPMI specifications, please visit Intel's website at www.intel.com.

3.3.11.1 IPMI Firmware Revision

This item displays the current IPMI firmware revision.

3.3.11.2 Status of BMC

Baseboard Management Controller (BMC) manages the interface between system management software and platform hardware. This is an informational feature which returns the status code of the BMC micro controller.

3.3.12 View BMC System Event Log

This feature displays the BMC System Event Log (SEL). It shows the total number of entries of BMC System Events. To view an event, select an Entry Number and press <Enter> to display the information as shown in the screen.

- Total Number of Entries

- SEL Entry Number
- SEL Record ID
- SEL Record Type
- Event Timestamp
- Generator ID
- Event Message Format User
- Event Sensor Type
- Event Sensor Number
- Event Dir Type
- Event Data

3.3.12.1 Clear BMC System Event Log

Select OK and press the <Enter> key to clear the BMC system log. Select Cancel to keep the BMC System log. The options are **OK** and Cancel.

Caution: Any cleared information is unrecoverable. Make absolutely sure that you no longer need any data stored in the log before clearing the BMC Event Log.

3.3.13 Set LAN Configuration

Set this feature to configure the IPMI LAN adapter with a network address as shown in the following graphics.

3.3.13.1 Channel Number

Enter the channel number for the SET LAN Config command. This is initially set to **[01]**. Press “+” or “-” on your keyboard to change the Channel Number.

3.3.13.2 Channel Number Status

This feature returns the channel status for the Channel Number selected above: Channel Number is “OK” or “Wrong Channel Number”.

3.3.14 IP Address Source

Select the source of this machine's IP address. If Static is selected, you will need to know and enter manually the IP address of this machine below. If DHCP is selected, the BIOS will search for a DHCP (Dynamic Host Configuration Protocol) server in the network it is attached to, and request the next available IP address. The options are **DHCP** and Static.

If DHCP is selected the following items will display:

IP Address

Enter the IP address for this machine. This should be in decimal and in dotted quad form, (i.e., 192.168.10.253). The value of each three-digit number separated by dots should not exceed 255 as shown in the screen below.

Subnet Mask

Subnet masks tell the network which subnet this machine belongs to. The value of each three-digit number separated by dots should not exceed 255.

Gateway Address

This is the IP address of the gateway in the network. This is usually a router.

Mac Address

The BIOS will automatically enter the Mac address of this machine; however it may be over-ridden. Mac addresses are 6 two-digit hexadecimal numbers (Base 16, 0 ~ 9, A, B, C, D, E, F) separated by dots. (i.e., 00.30.48.D0.D4.60).

This enables or disables Event Messages for PEF action. Refer to Table 24.6 of the IPMI 1.5 Specification for more information at www.intel.com. The options are **Disabled** and Enabled.

BMC Watch Dog Timer Action

This feature allows the BMC (Baseboard Management Controller) Watch Dog to reset or power down the system if the operating system hangs or crashes. The options are **Disabled**, Reset System, Power Down, Power Cycle.

BMC Watch Dog TimeOut [Min:Sec]

This option appears if BMC Watch Dog Timer Action (above) is enabled. This is a timed delay in minutes or seconds, before a system power down or reset after an operating system failure is detected. The options are **[5 Min.]**, [1 Min.], [30 Sec.], and [10 Sec.].

3.3.15 Event Log Configuration

3.3.15.1 View Event Log

Use this option to view the System Event Log.

3.3.15.2 Mark all events as read

This option marks all events as read. The options are **OK** and Cancel.

3.3.15.3 Clear event log

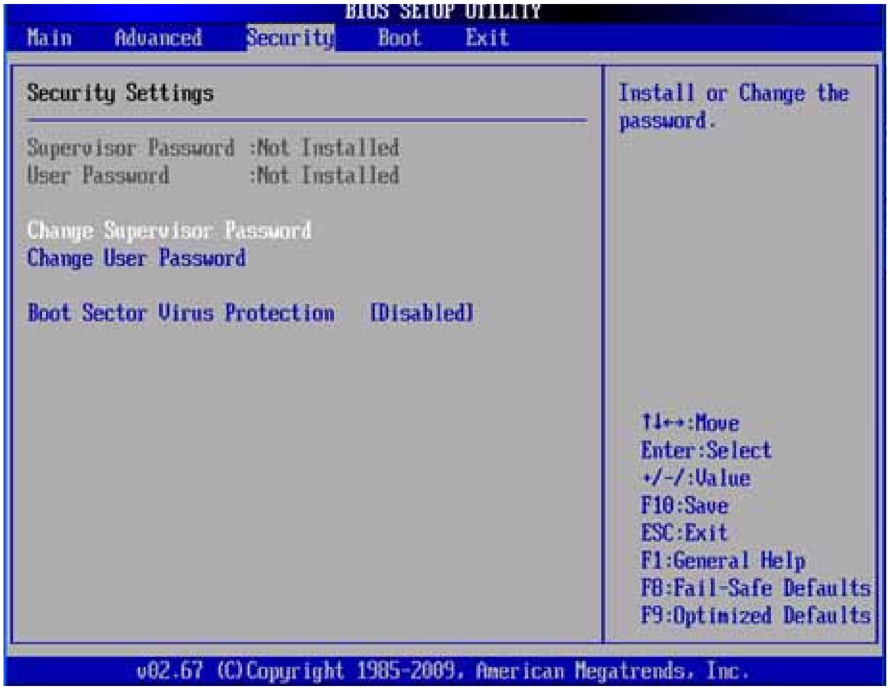
This option clears the Event Log memory of all messages. The options are OK and **Cancel**.

3.3.15.4 PCIE Error Log

Use this option to enable PCI error (PERR) logging. The options are Yes and **No**.

3.4 Security Settings

The AMI BIOS provides a Supervisor and a User password. If you use both passwords, the Supervisor password must be set first.


BIOS SETUP UTILITY
Main
Advanced
Security
Boot
Exit
↑↓↔:Move
Enter:Select
+/-/:Value
F10:Save
ESC:Exit
F1:General Help
F8:Fail-Safe Defaults
F9:Optimized Defaults

Security Settings

Supervisor Password :Not Installed
User Password :Not Installed

Change Supervisor Password
Change User Password

Boot Sector Virus Protection [Disabled]

Install or Change the password.

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Figure 3-3. Security Settings

3.4.1 Supervisor Password

This item indicates if a Supervisor password has been entered for the system. “Not Installed” means a Supervisor password has not been used.

3.4.2 User Password

This item indicates if a user password has been entered for the system. “Not Installed” means that a user password has not been used.

3.4.3 Change Supervisor Password

Select this feature and press <Enter> to access the submenu, and then type in a new

Supervisor Password.

3.4.4 User Access Level (Available when Supervisor Password is set as above)

Available options are **Full Access**: grants full User read and write access to the Setup Utility, View Only: allows access to the Setup Utility but the fields cannot be changed, Limited: allows only limited fields to be changed such as Date and Time, No Access: prevents User access to the Setup Utility.

3.4.5 Change User Password (Available when a User Password is installed)

Select this feature and press <Enter> to access the submenu, and then type in a new User Password.

3.4.6 Clear User Password (Available only when User Password is installed)

This item allows you to clear a user password after it has been entered.

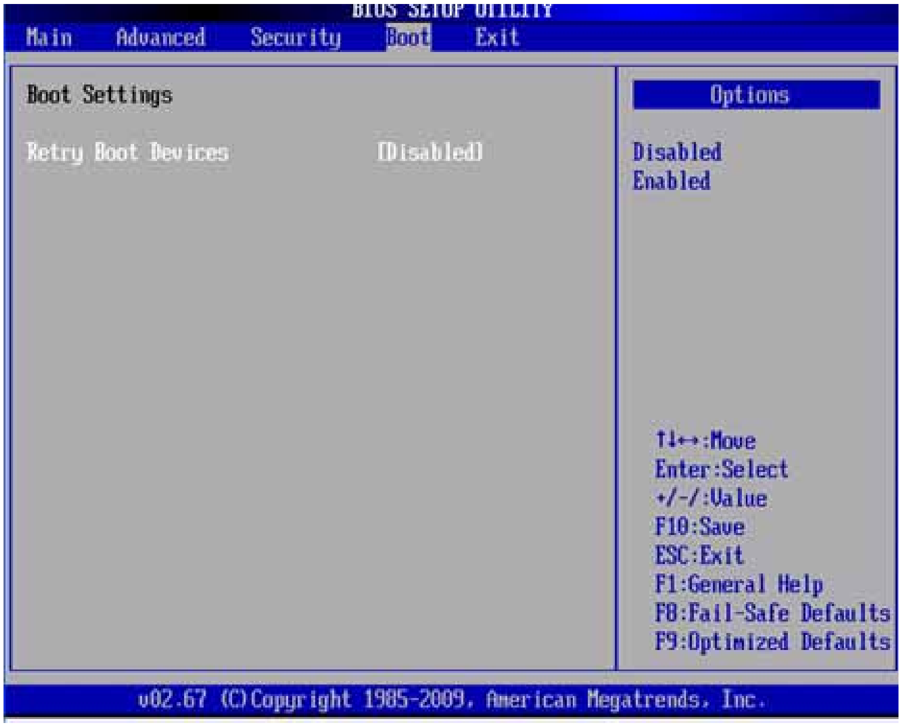
3.4.7 Password Check (Available when a password is installed)

This item forces the system to prompt for a password only when entering BIOS setup or during each bootup. The options are **Setup** and Always.

3.4.8 Boot Sector Virus Protection

When Enabled, the AMI BIOS displays a warning when any program (or virus) issues a Format command or attempts to write to the boot sector of the storage drive. The options are Enabled and **Disabled**.

3.5 Boot Configuration


BIOS SETUP UTILITY
Main
Advanced
Security
Boot
Exit
Boot Settings
Options
Disabled
Enabled
↑↓↔:Move
Enter:Select
+/-/:Value
F10:Save
ESC:Exit
F1:General Help
F8:Fail-Safe Defaults
F9:Optimized Defaults
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Retry Boot Devices [Disabled]

Figure 3-4. Boot Settings

Use this feature to configure boot settings.

3.5.1 Boot Device Priority

This feature allows the user to specify the sequence of priority for the Boot Device. The settings are 1st boot device, 2nd boot device, 3rd boot device, 4th boot device, 5th boot device and Disabled.

- 1st Boot Device/2nd Boot Device

3.5.2 Storage Drives

This feature allows the user to specify the boot sequence from all available storage drives. The settings are Disabled and a list of all storage drives that have been detected (i.e., 1st Drive, 2nd Drive, 3rd Drive, etc.).

- 1st Drive

3.5.3 Removable Drives

This feature allows the user to specify the boot sequence from available Removable Drives. The settings are 1st boot device, 2nd boot device, and Disabled.

- 1st Drive/2nd Drive

3.5.4 CD/DVD Drives

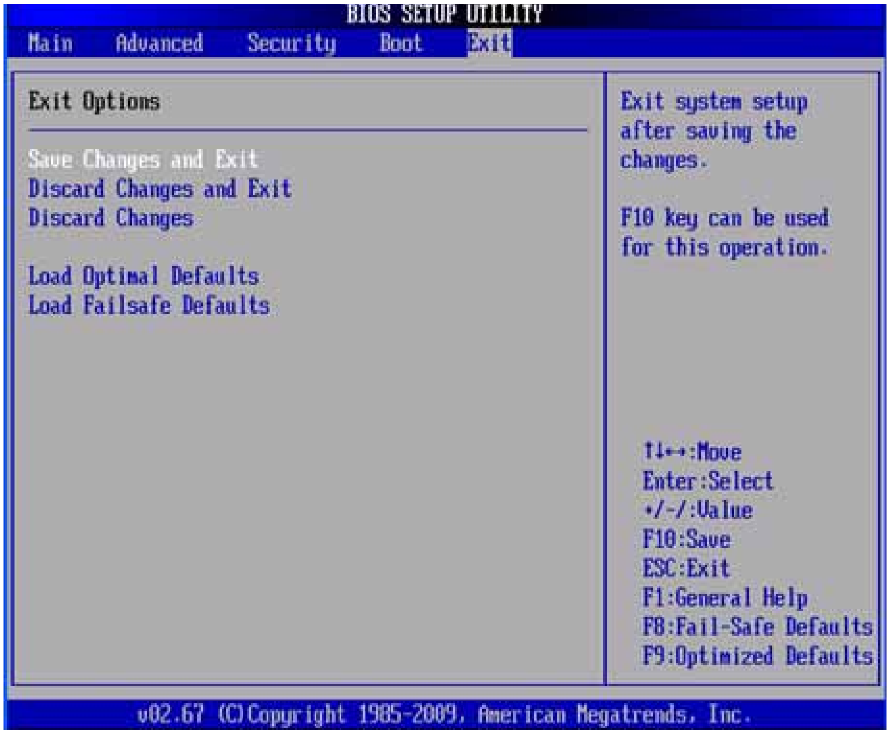
This feature allows the user to specify the boot sequence from available CD/DVD Drives.

3.5.5 Retry Boot Devices

If this feature is enabled, the system will continue to search for the next boot device if the current boot device is not available. The options are Enabled and **Disabled**.

3.6 Exit Options

Select the Exit tab from the AMI BIOS Setup Utility screen to enter the Exit Setup screen.



Exit Options

Save Changes and Exit
Discard Changes and Exit
Discard Changes

Load Optimal Defaults
Load Failsafe Defaults

Exit system setup after saving the changes.

F10 key can be used for this operation.

↑↓←→:Move
Enter:Select
+/-/:Value
F10:Save
ESC:Exit
F1:General Help
F8:Fail-Safe Defaults
F9:Optimized Defaults

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Figure 3-5. Exit Options

3.6.1 Save Changes and Exit

After configuring the Setup settings, select this option to save the changes and exit the BIOS Setup Utility and reboot the computer, so the new system configuration parameters can take effect. Select Save Changes and Exit from the Exit menu and press <Enter>.

3.6.2 Discard Changes and Exit

Select this option to quit the BIOS Setup without making any permanent changes to the system configuration, and reboot the computer. Select Discard Changes and Exit from the Exit menu and press <Enter>.

3.6.3 Discard Changes

Select this option and press <Enter> to discard all the changes and return to the AMI BIOS Utility Program.

3.6.4 Load Optimal Defaults

Select this item to automatically load Optimal Defaults from the Exit menu and press <Enter>. Then, select OK to allow the AMI BIOS to automatically load Optimal Defaults to the BIOS Settings. The Optimal settings are designed for maximum system performance, but may not work best for all computer applications.

3.6.5 Load Fail-Safe Defaults

To set this feature, select Load Fail-Safe Defaults from the Exit menu and press <Enter>. The Fail-Safe settings are designed for maximum system stability, but not for maximum performance.

3.7 BIOS Recovery

Caution: Do not upgrade the BIOS unless your system has a BIOS-related issue. Flashing the wrong BIOS can cause irreparable damage to the system. In no event shall Themis be liable for direct, indirect, special, incidental, or consequential damages arising from a BIOS update. If you need to update the BIOS, do not shut down or reset the system while the BIOS is updating. This is to avoid possible boot failure.

How to Recover the AMIBIOS Image (Main BIOS Block)

An AMIBIOS flash chip consists of a boot sector block, and a main BIOS code block (a main BIOS image). The boot sector block contains critical BIOS code, including memory detection and recovery code to be used to flash a new BIOS image if the original BIOS Image is corrupted. When the system is powered on, the boot sector code executes first. Once it is completed, the main BIOS code will continue with system initialization and complete the bootup process.

Note: BIOS Recovery described below is used when the main BIOS block crashes. However, when the BIOS Boot sector crashes, you will need to send the motherboard back to Supermicro for RMA repairs.

3.7.1 Boot Sector Recovery from a USB Device

This feature allows the user to recover a BIOS image using a USB device without additional utilities needed. A user can download the BIOS image into a USB flash device, and name the file “SUPER.ROM” for the recovery process to load the file. A USB flash device such as a USB Flash Drive, a USB CDROM or a USB CDRW device can be used for this purpose:

1. Insert the USB device that contains the new BIOS image (the ROM files) saved in a root directory into your USB drive.
2. While turning the power on, press and hold <Ctrl> and <Home> at the same time until the USB Access LED Indicator comes on. This might take a few seconds.
3. Once the USB drive LED is on, release the <Ctrl> and <Home> keys. AMI-BIOS will issue beep codes to indicate that the BIOS ROM file is being updated.
4. When BIOS flashing is completed, the computer will reboot. Do not interrupt the flashing process until it is completed.

3.7.2 Boot Sector Recovery from an IDE CD-ROM

This process is almost identical to the process of Boot Sector Recovery from a USB device, except that the BIOS image file is loaded from a CD-ROM. Use a CD-R or CD-RW drive to burn a CD with the BIOS image file in it, and name the file “SUPER.ROM” for the recovery process to load the file.

3.7.3 Boot Sector Recovery from a Serial Port (“Serial Flash”)

This process, also known as “Serial Flash,” allows the user to use a serial port to load a BIOS image for Boot Sector recovery. This feature is usually used for embedded systems that rely on a serial port for remote access and debugging.

3.7.3.1 Requirements

In order to use Serial Flash for Boot Sector Recovery, you will need to meet the following requirements.

- The “Target system,” the system that needs BIOS updates, must have a serial port and “Serial Flash” support embedded in the BIOS image file.

- The “Host system” should also have a serial port and a terminal program that supports XModem Transfer protocol (Hyper Terminal for the Windows operating systems, and minicom for Linux/FreeSBD, etc.).
- A Null_modem serial cable

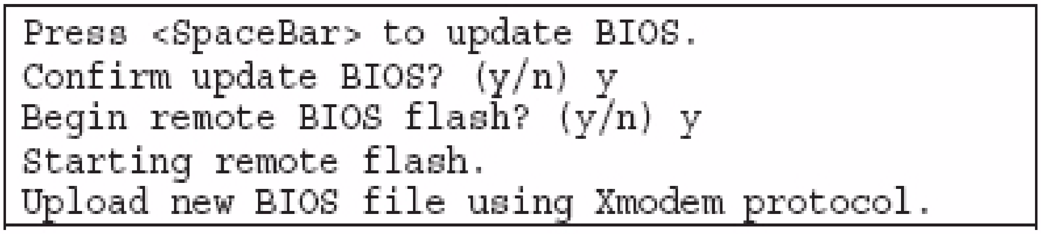
How to use Serial Flash for Boot Sector Recovery:

1. Connect a Null_modem serial cable between the target system and the host system that runs the terminal program.
2. Make sure that the new BIOS Image file is accessible for the host system.
3. Start the terminal program on the host system and create a new connection.

Use the following communication parameters for the new connection.

- Bits per second: 115200 bits/sec.
- Data Bits: 8
- Parity: None
- Stop Bit: 1
- Flow Control: None

4. Power on your system and click the <Connect> button in the Hyper Terminal. The terminal screen will display the following messages.



```
Press <SpaceBar> to update BIOS.
Confirm update BIOS? (y/n) y
Begin remote BIOS flash? (y/n) y
Starting remote flash.
Upload new BIOS file using Xmodem protocol.
```

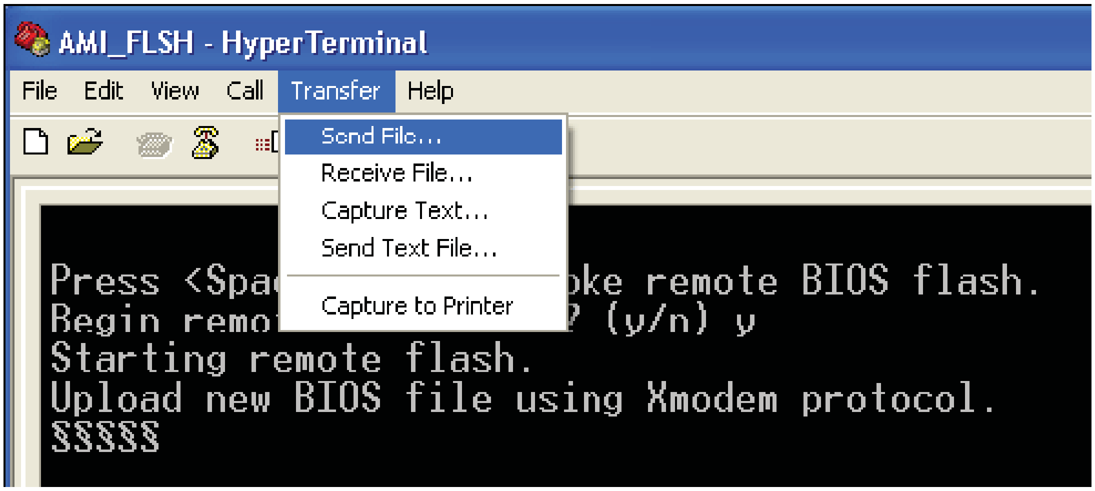
5. Follow the instructions given on the screen to update the BIOS. These instructions are also shown below.
   - **a.** At the prompt, press the <SpaceBar> to update the BIOS.
   - **b.** When asked to confirm BIOS updating, press <y> to confirm BIOS updates.

   c. Press <y> again to begin flashing BIOS remotely..

> ***Note:*** Be sure to complete Steps a to c above quickly because you have a second or less to do so.

6. Once you've completed the instructions given, a screen will display to indicate that remote flashing is starting and the new BIOS file is being uploaded.
7. To use Hyper Terminal to transfer the XModem protocol by using the “Send File” dialog under the “Transfer” menu, follow the instructions below to complete XModem transfers.

   a. Select the “Transfer” menu and enter <Send>.

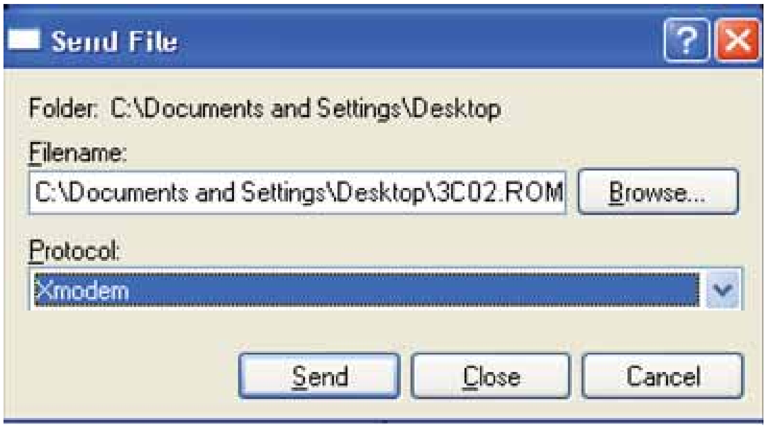

AMI_FLSH - HyperTerminal
File
Edit
View
Call
Transfer
Help
Send File...
Receive File...
Capture Text...
Send Text File...
Capture to Printer

```
Press <Spa           oke remote BIOS flash.
Begin remo           ? (y/n) y
Starting remote flash.
Upload new BIOS file using Xmodem protocol.
§§§§§
```

Figure 3-6. AMI_FLSH HyperTerminal

   b. Specify the location of the ROM file and select the proper protocol (XModem).

c. Press <Send> to start ROM File extraction. (See the picture below.)



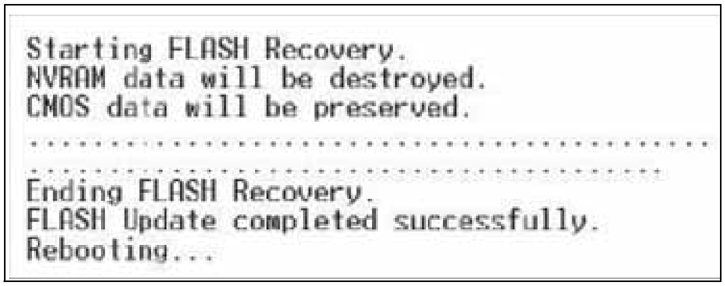
Folder: C:\Documents and Settings\Desktop

Filename: C:\Documents and Settings\Desktop\3C02.ROM

Protocol: Xmodem

Figure 3-7. ROM File Extraction

d. Once the ROM file extraction is completed, the message: “New BIOS received OK” will display:



```
Starting FLASH Recovery.
NVRAM data will be destroyed.
CMOS data will be preserved.
..........................................
.........................................
Ending FLASH Recovery.
FLASH Update completed successfully.
Rebooting...
```

Figure 3-8. Flash Recovery

8. Once remote BIOS flash is completed, the system will reboot.

> ***Note:*** AMIBIOS Serial Flash will work with any terminal communications program that supports VT-100 and XModem protocols, including protocols designed for GNU/LINUX & BSD operating systems such as minicom. It is recommended that the terminal program be configured to use the 'CR/LF' style of line termination.

3.8 BIOS Error Beep Codes

During the POST (Power-On Self-Test) routines, which are performed each time the system is powered on, errors may occur.

Non-fatal errors are those which, in most cases, allow the system to continue the boot-up process. The error messages normally appear on the screen.

Fatal errors will not allow the system to continue the boot-up procedure. If a fatal error occurs, you should consult with your system manufacturer for possible repairs.

These fatal errors are usually communicated through a series of audible beeps. The numbers on the fatal error list correspond to the number of beeps for the corresponding error.

BIOS Error Beep Codes		
Beep Code	**Error Message**	**Description**
1 beep	Refresh	Circuits have been reset. (Ready to power up)
5 short beeps + 1 long beep	Memory error	No memory detected in the system
8 beeps	Display memory read/write error	Video adapter missing or with faulty memory
1 continuous beep w/Front Panel OH LED on	System Overheat	1 continuous beep with the front panel OH LED on

Table 1: BIOS Error Beep Codes

Appendix A

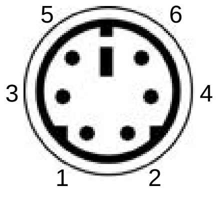
Connector Pinouts

This appendix provides connector pinouts for all standard user I/O interfaces on the rear I/O panel of the RES-12XR3-S for X8DTL-6/-6F.

A.1 PS/2 Keyboard and Mouse

The RES-12XR3-S provides a 6-pin **female** mini-DIN connector for the PS/2 keyboard, and another for the PS/2 mouse. Signals for both connectors are defined in *Table A-1*.

Table A-1. PS/2 Keyboard/Mouse Pinout and Signal Descriptions



Pin	Signal Name
1	Keyboard/mouse data
2	*N/C*
3	Ground
4	Vcc
5	Keyboard/mouse clock
6	*N/C*

A.2 USB Ports

The RES-12XR3-S supports two USB port connectors (see *Figure A-1* for a connector pinout), USB 0 and USB 1, on the rear I/O panel. An additional onboard USB port (USB 2) and 2 USB internal headers can be accessed directly from the motherboard.

Pinout signal descriptions are listed in *Table A-2*.

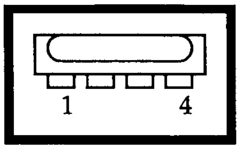


Figure A-1. USB Connector Pinout

Table A-2. USB Connector Pinout Signal Descriptions

Pin	Signal Name	Pin	Signal Name
1	+5V	3	PO+
2	PO–	4	GND

A.3 Serial Port

The RES-12XR3-S supports one **male** DB9 serial port connector (COM 1) on the rear I/O panel (see *Figure A-2* for a pinout), and a second serial header on the motherboard. COM 1 pinout signal descriptions are listed in *Table A-3*.

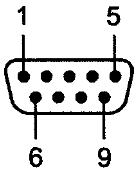


Figure A-2. COM 1 Serial Connector Pinout

Table A-3. COM 1 Serial Connector Pinout Signal Descriptions

Pin	Signal Name	Pin	Signal Name	Pin	Signal Name
1	DCD	4	DTR	7	RTS
2	RXD	5	GND	8	CTS
3	TXD	6	DSR	9	RI

A.4 VGA Display Port

The RES-12XR3-S supports a single 15-pin (three 5-pin rows) **female** VGA graphics display port connector on the rear I/O panel (see *Figure A-3* for a connector pinout). Pinout signal descriptions are listed in *Table A-4*

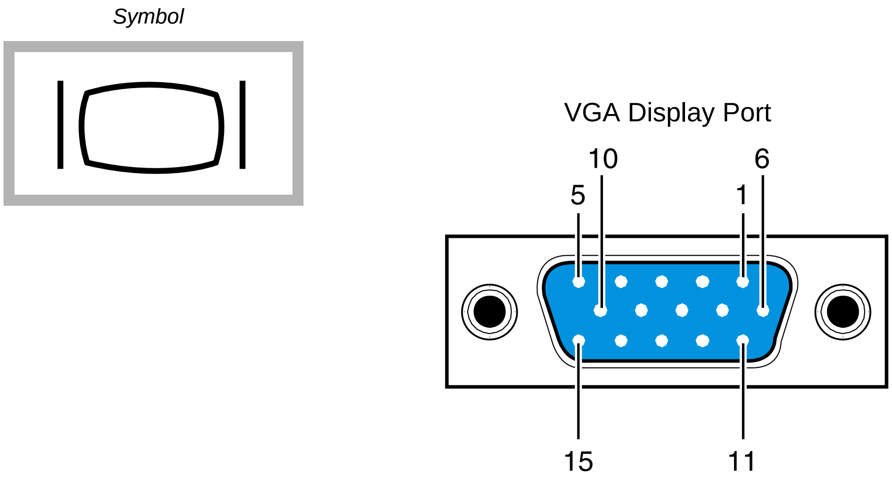


Figure A-3. RES-12XR3-S VGA Connector Pinout

Table A-4. RES-12XR3-S VGA Connector Pinout Signals

Pin	VGA Signal	Description
1	RED OUT	Red signal output
2	GREEN OUT	Green signal output
3	BLUE OUT	Blue signal output
4	MS2	Monitor ID bit 2
5	GND	Ground (HSync)
6	GND	Red return
7	GND	Green return
8	GND	Blue return
9	NC	Key (no pin)
10	GND	Ground (VSync)
11	MS0	Monitor ID bit 0
12	MS1: SDA (DDC Data)	Monitor ID bit 1
13	HSYNC	Horizontal synchronization
14	VSYNC	Vertical synchronization
15	MS3: SCL (DDC CLK)	Monitor ID bit 3

A.5 Gigabit Ethernet LAN Ports

The RES-12XR3-S supports two RJ45 Gigabit Ethernet LAN port connectors (LAN 1 and LAN 2), each with two embedded LEDs (see *Figure A-4*).

Pinout signal descriptions are listed in *Table A-5*.

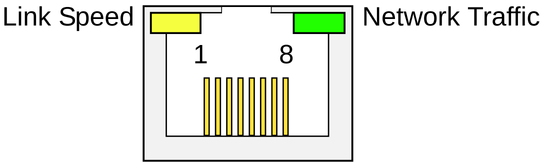


Figure A-4. Ethernet Connector, Type RJ45

Table A-5. RJ45 Ethernet Pinout Signals

Pin	Signal Name	Pin	Signal Name
1	TRD0+	5	TRD2-
2	TRD0-	6	TRD1-
3	TRD1+	7	TRD3+
4	TRD2+	8	TRD3-

- The color of the left LED indicates the LAN connection speed:
  — Off = 10 MHz
  — Green = 100 MHz
  — Amber = 1 GHz
- The right LED, when lit, indicates LAN activity (network traffic).

A.6 IPMI Dedicated LAN Port (X8DTL-6F Only)

The single IPMI dedicated Ethernet LAN port on the RES-12XR3-S rear I/O panel has identical pinout and signal descriptions as the LAN 1 and LAN 2 Ethernet ports described in the previous Section A.5, “Gigabit Ethernet LAN Ports”.

Appendix B

Rack-Mount Slide Installation

An *optional* set of two rack-mount slides (left side and right side) is available for all RES-32 systems, and should be ordered at the time of purchase. The RES-12XR3-S for X8DTL-6/-6F chassis contains five threaded screw holes on each side to accommodate #8-32 size screws (included with the rack-mount slide kit); steel slides require four mounting holes, and aluminum slides require three mounting holes (see *Figure B-1*).

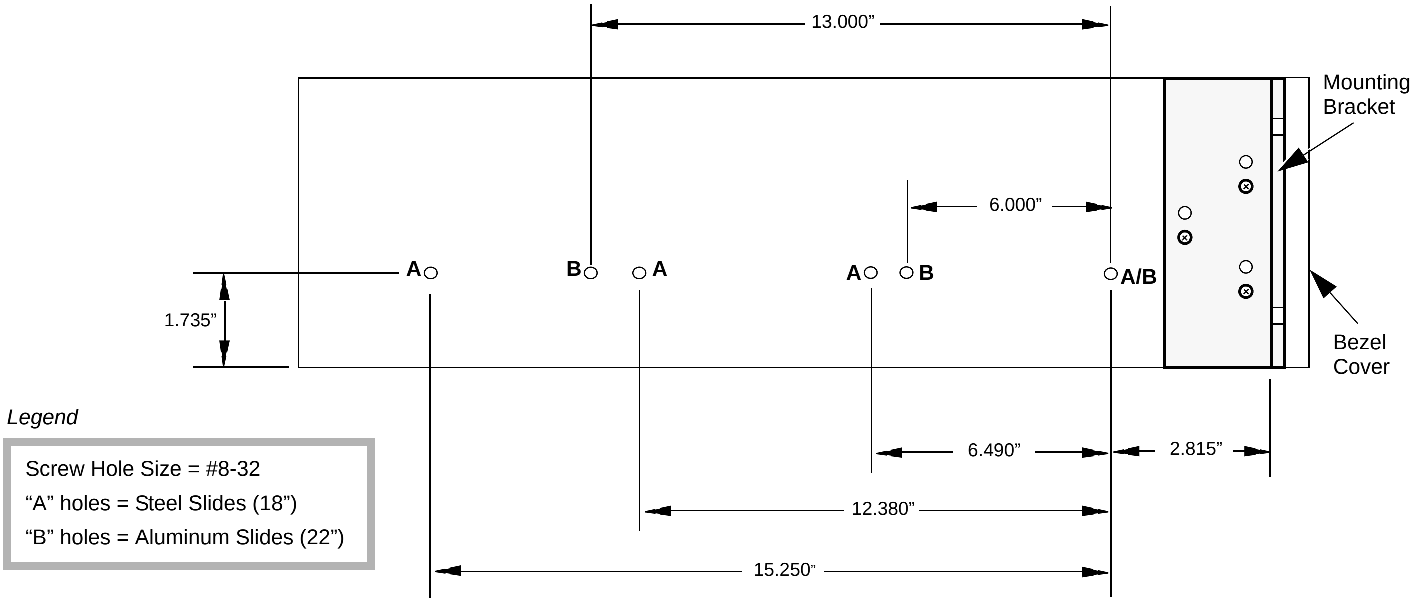

13.000”
Mounting Bracket
6.000”
A
B
A
A
B
A/B
1.735”
Bezel Cover
Legend
Screw Hole Size = #8-32
“A” holes = Steel Slides (18”)
“B” holes = Aluminum Slides (22”)
6.490”
2.815”
12.380”
15.250”

Figure B-1. Screw Locations for Rack-Mount Slides

Dimensions of the screw-hole patterns on the sides of the RES-12XR3-S for X8DTL-6/-6F chassis for installing rack-mount slides are shown in *Figure B-1*. Holes for steel slides are marked “A” and holes for aluminum (Jonathan) slides are marked “B”.

Caution: Any screws used to mount a slide to a RES-32 chassis must not exceed a length of 3/8” to prevent excessive penetration of the chassis.

The rack-mount slide installation kit includes the following items:

a. Two inside slide sections

b. Two outside slide sections

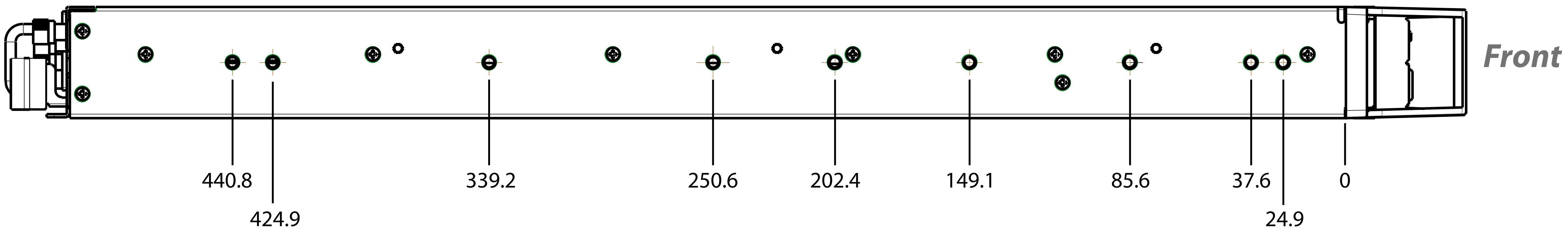
c. Two front (short) slide brackets

d. Two rear (long) slide brackets

e. Assorted screws, washers, and nuts

Follow these steps to install a steel rack-mount slide to the RES-12XR3-S for X8DTL-6/-6F chassis:

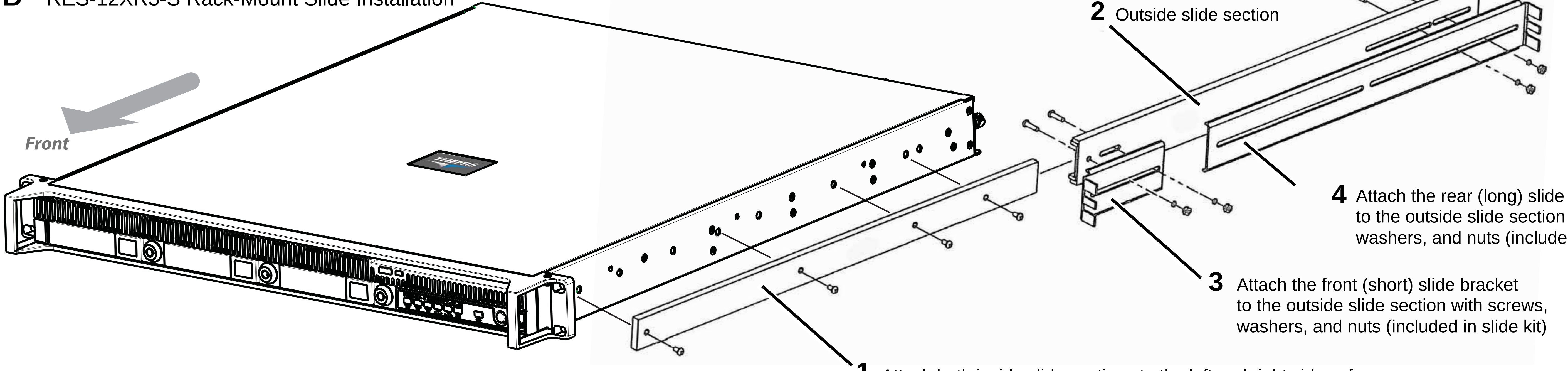
1. Attach the inside slide section (see *Figure B-2* on page B-3) to both sides of the RES-12XR3-S for X8DTL-6/-6F chassis using four #8-32 screws per side.
2. Measure the depth of the 19” equipment rack into which the RES-12XR3-S for X8DTL-6/-6F system will be installed (this can vary from 24” to 30”).
3. Using the depth of the equipment rack, adjust and attach the front and rear slide brackets to the outside slide section using the screws, washers, and nuts provided with the slide kit.
4. With all slide brackets securely attached to both the right and left outside slide sections, install both sections to the inside right and inside left of a 19” rack with two bolts per bracket, making sure there is adequate room for the 3-RU height (5.25”) of a RES-12XR3-S for X8DTL-6/-6F system.
5. Carefully insert the RES-12XR3-S for X8DTL-6/-6F system into the 19” rack so that the inside slides on both sides of the chassis travel smoothly into the channels of the outside slide sections. Push the system into the rack until the mounting brackets on the front of the chassis are flush with the front of the rack.
6. Secure the RES-12XR3-S for X8DTL-6/-6F system to the 19” rack with two bolts on each side.



A Side View of the RES-12XR3-S Slide Installation

Note: All Dimensions are given in millimeters (mm).

B RES-12XR3-S Rack-Mount Slide Installation



2 Outside slide section

4 Attach the rear (long) slide bracket to the outside slide section with screws, washers, and nuts (included in slide kit)

3 Attach the front (short) slide bracket to the outside slide section with screws, washers, and nuts (included in slide kit)

1 Attach both inside slide sections to the left and right sides of the RES-12XR3-S chassis with #8-32 screws (included in slide kit)

Note: Graphic shown above is for slide placement only; chassis shown is not an accurate representation of the RES-12XR3-S.

Figure B-2. RES-12XR3-S for X8DTL-6/-6F Rack-Mount Slide Installation

Appendix C

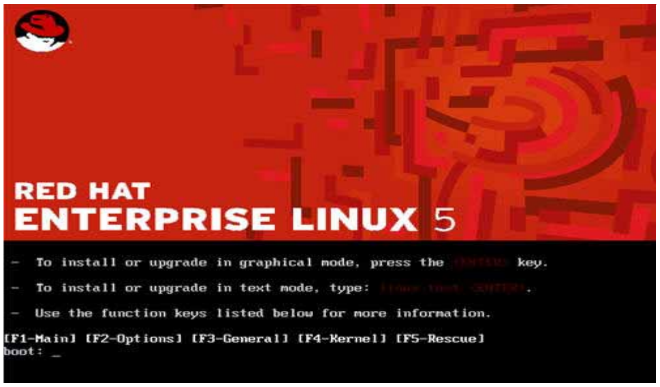
Red Hat Enterprise Linux 5 Installation

C.1 Introduction

Welcome to the Red Hat® Enterprise Linux® Installation Guide. This guide contains useful information to assist you during the installation of Red Hat Enterprise Linux via DVD device, from fundamental concepts such as installation preparation to the step-by-step installation procedure.

C.2 Installation

C.2.1 Step 1.

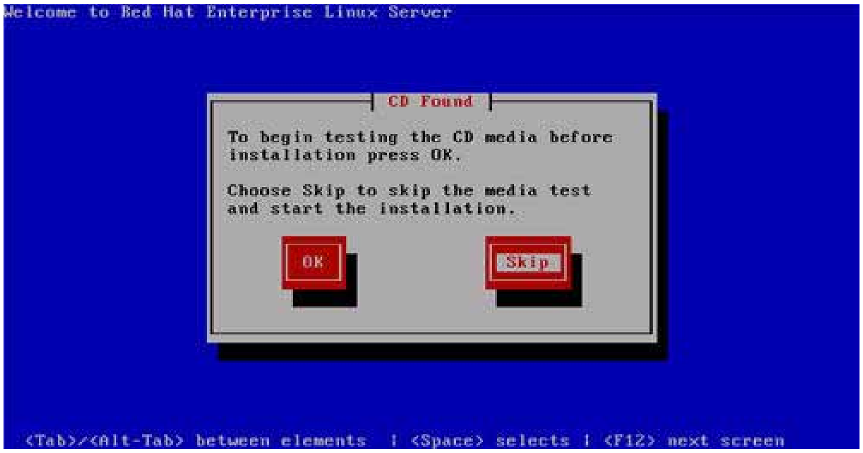


```
-  To install or upgrade in graphical mode, press the [illegible] key.
-  To install or upgrade in text mode, type: [illegible].
-  Use the function keys listed below for more information.
[F1-Main] [F2-Options] [F3-General] [F4-Kernel] [F5-Rescue]
boot: _
```

Figure C-1. Power On after Linux DVD is Inserted into Drive

Step 1: Insert the Redhat Enterprise Linux 5 DVD and Power on the system; you will see the first installation screen with a boot prompt, press “ENTER” to begin installation (see *Figure C-1 on page C-2*).

C.2.2 Step 2.



```
Welcome to Red Hat Enterprise Linux Server

CD Found

To begin testing the CD media before
installation press OK.

Choose Skip to skip the media test
and start the installation.

<Tab>/<Alt-Tab> between elements  | <Space> selects | <F12> next screen
```

Figure C-2. Skip Key

Step 2: Press the “tab” key to move focus to the “Skip” key, then press the “Enter” key to continue to the Welcome screen. (See *Figure C-2 on page C-2*).

C.2.3 Step 3

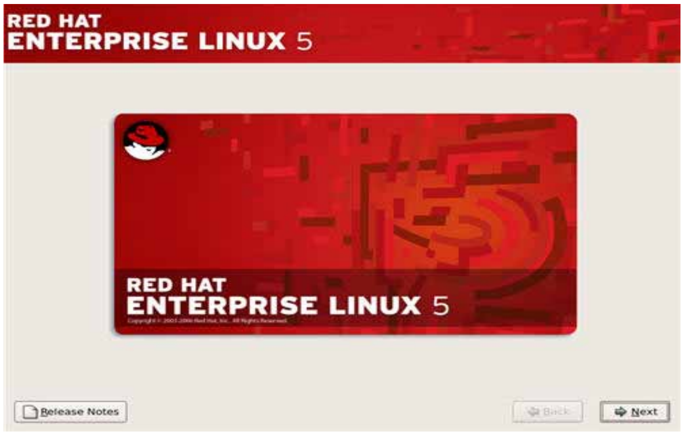
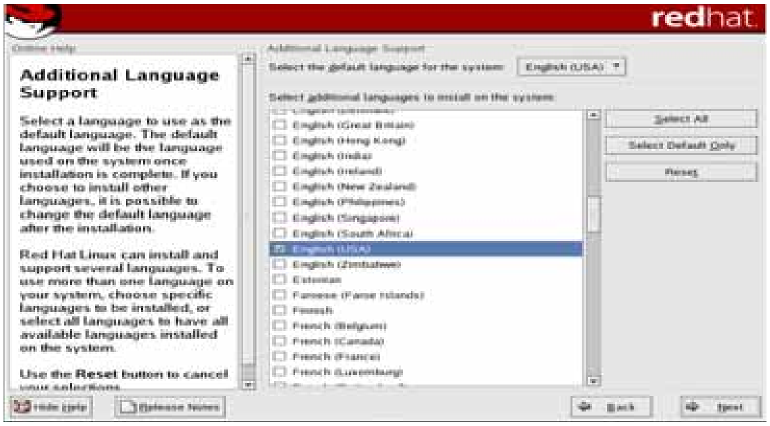


Figure C-3. Welcome Screen

Step 3: Press Enter and you will see the **Welcome** screen. The Welcome screen does not prompt you for any input. From this screen you can access the Release Notes for Red Hat Enterprise Linux 5.0.0 by clicking on the Release Notes button (see *Figure C-3 on page C-3*.) Click the **Next** button to continue.

C.2.4 Step 4



Additional Language Support

Select a language to use as the default language. The default language will be the language used on the system once installation is complete. If you choose to install other languages, it is possible to change the default language after the installation.

Red Hat Linux can install and support several languages. To use more than one language on your system, choose specific languages to be installed, or select all languages to have all available languages installed on the system.

Use the **Reset** button to cancel

Select the default language for the system: English (USA)

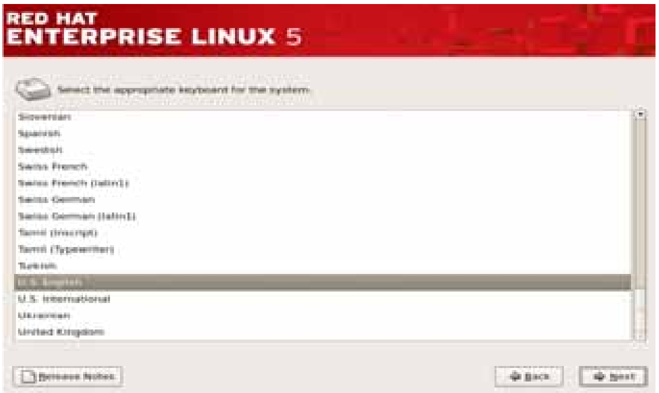
Select additional languages to install on the system:

☐ English (Great Britain)
☐ English (Hong Kong)
☐ English (India)
☐ English (Ireland)
☐ English (New Zealand)
☐ English (Philippines)
☐ English (Singapore)
☐ English (South Africa)
☑ English (USA)
☐ English (Zimbabwe)
☐ Estonian
☐ Faroese (Faroe Islands)
☐ Finnish
☐ French (Belgium)
☐ French (Canada)
☐ French (France)
☐ French (Luxemburg)

Figure C-4. Language Selection

Step 4: Using your mouse, select a language to use for the installation. The language you select here will become the default language for the operating system once it is installed. Selecting the appropriate language also helps target your time zone configuration later in the installation. The installation program tries to define the appropriate time zone based on what you specify on this screen. Once you have made the language selection, click **Next** to continue. (see *Figure C-4 on page C-3*).

C.2.5 Step 5



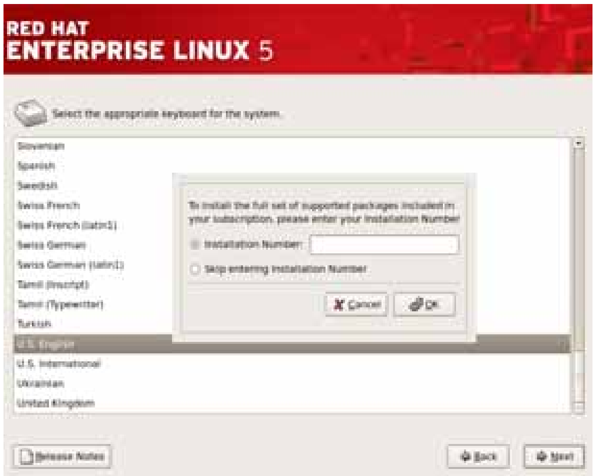
Select the appropriate keyboard for the system.

Slovenian
Spanish
Swedish
Swiss French
Swiss French (latin1)
Swiss German
Swiss German (latin1)
Tamil (Inscript)
Tamil (Typewriter)
Turkish
U.S. English
U.S. International
Ukrainian
United Kingdom

Figure C-5. Selecting Layout Type

Step 5: Using your mouse, select the correct layout type (for example, U.S. English) for the keyboard you would prefer to use for the installation and as the system default. Once you have made the selection, click **Next** to continue. (see *Figure C-5 on page C-4*).

C.2.6 Step 6



Select the appropriate keyboard for the system.

Slovenian
Spanish
Swedish
Swiss French
Swiss French (latin1)
Swiss German
Swiss German (latin1)
Tamil (Inscript)
Tamil (Typewriter)
Turkish
U.S. English
U.S. International
Ukrainian
United Kingdom

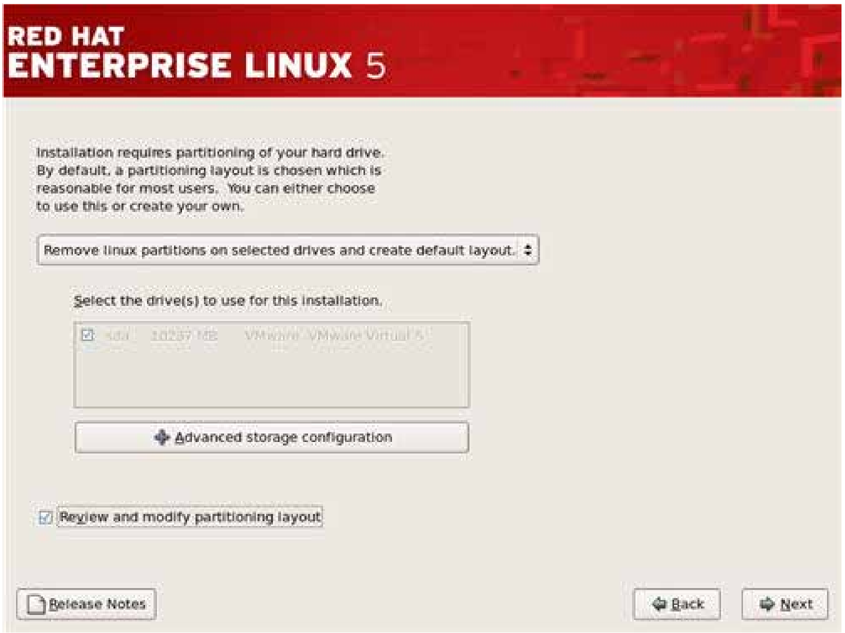
To install the full set of supported packages included in your subscription, please enter your Installation Number

● Installation Number:
○ Skip entering Installation Number

Figure C-6. Enter Installation Number

Step 6: Enter the installation number, if you don't have an installation number; select the Skip Entering Installation Number Radio Button. Click OK, and if you did not enter an installation number, you'll be given a warning. Click Skip to continue, otherwise click Next to continue.(see *Figure C-6 on page C-4*).

C.2.7 Step 7



Installation requires partitioning of your hard drive. By default, a partitioning layout is chosen which is reasonable for most users. You can either choose to use this or create your own.

Remove linux partitions on selected drives and create default layout.

Select the drive(s) to use for this installation.

☑ sda 10237 MB VMware, VMware Virtual S

☑ Review and modify partitioning layout

Figure C-7. Partitioning

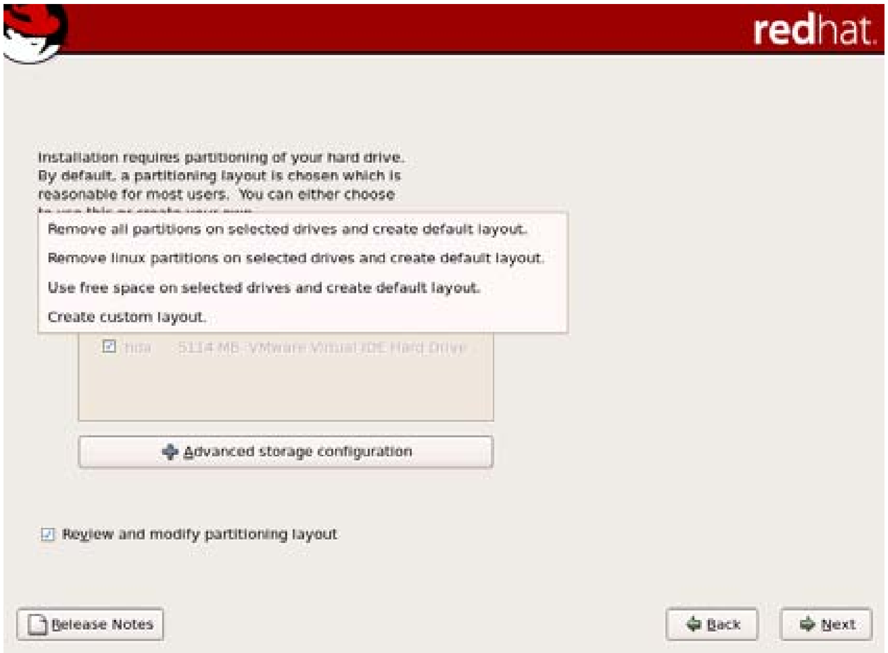
Step 7: Partitioning allows you to divide your hard drive into isolated sections, where each section behaves as its own hard drive. Partitioning is particularly useful if you run multiple operating systems.

On this screen you can choose to create the default layout or choose to manually partition using the 'Create custom layout' option of **Disk Druid**.

The first three options allow you to perform an automated installation without having to partition your drive(s) yourself. If you do not feel comfortable with partitioning your system, it is recommended that you *do not* choose to create a custom layout and instead let the installation program partition for you.

You can configure an iSCSI target for installation, or disable a dmraid device from this screen by clicking on the 'Advanced storage configuration' button (see *Figure C-7 on page C-5*). Click **Next** to continue.

C.2.8 Step 8



Installation requires partitioning of your hard drive. By default, a partitioning layout is chosen which is reasonable for most users. You can either choose

redhat.
Remove all partitions on selected drives and create default layout.
Remove linux partitions on selected drives and create default layout.
Use free space on selected drives and create default layout.
Create custom layout.
Advanced storage configuration
Release Notes
Back
Next

☑ hda 5114 MB VMware Virtual IDE Hard Drive

☑ Review and modify partitioning layout

Figure C-8. Reviewing Option

Step 8: Create default layout allows you to have some control concerning what data is removed (if any) from your system. Your options are:

- **Remove all partitions on selected drives and create default layout —** select this option to remove all partitions on your hard drive(s) (this includes partitions created by other operating systems such as Windows VFAT or NTFS partitions).

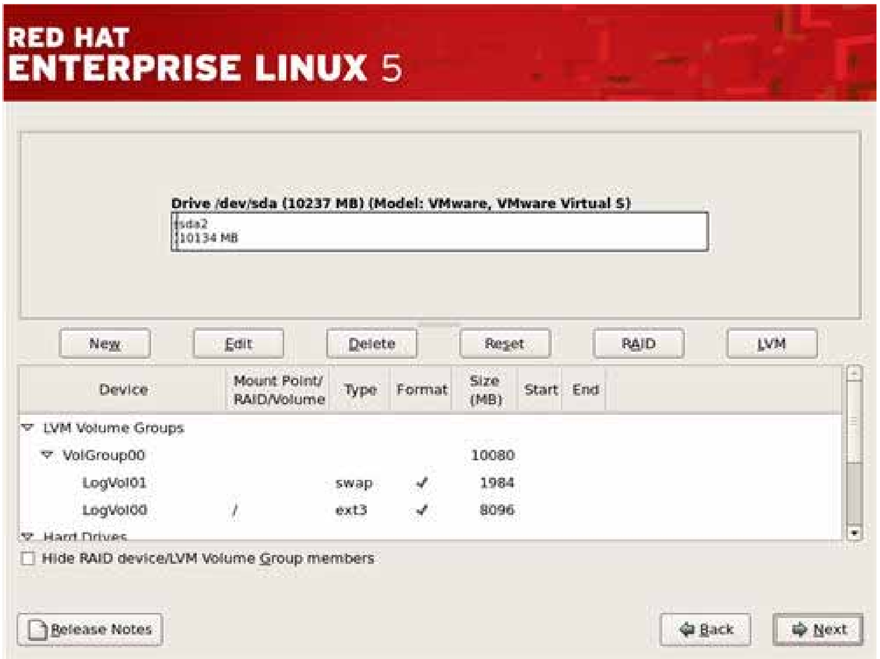
- **Remove Linux partitions on selected drives and create default layout —** select this option to remove only Linux partitions (partitions created from a previous Linux installation).
This does not remove other partitions you may have on your hard drive(s) (such as VFAT or FAT32 partitions).

- **Use free space on selected drives and create default layout —** select this option to retain your current data and partitions, assuming you have enough free space available on your hard drive(s).

Using your mouse, choose the storage drive(s) on which you want Red Hat Enterprise Linux to be installed. If you have two or more drives, you can choose which drive(s) should contain this installation. Unselected drives, and any data on them, are not touched.

To review and make any necessary changes to the partitions created by automatic partitioning, select the **Review** option. After selecting **Review** and clicking **Next** to move forward, the partitions created for you appear in **Disk Druid.** You can make modifications to these partitions if they do not meet your needs (see *Figure C-8 on page C-6*). Click **Next** once you have made your selections to proceed.

C.2.9 Step 9



Drive /dev/sda (10237 MB) (Model: VMware, VMware Virtual S)
sda2
10134 MB

Device	Mount Point/ RAID/Volume	Type	Format	Size (MB)	Start	End
▽ LVM Volume Groups						
▽ VolGroup00				10080		
LogVol01		swap	✓	1984		
LogVol00	/	ext3	✓	8096		
▽ Hard Drives						

☐ Hide RAID device/LVM Volume Group members

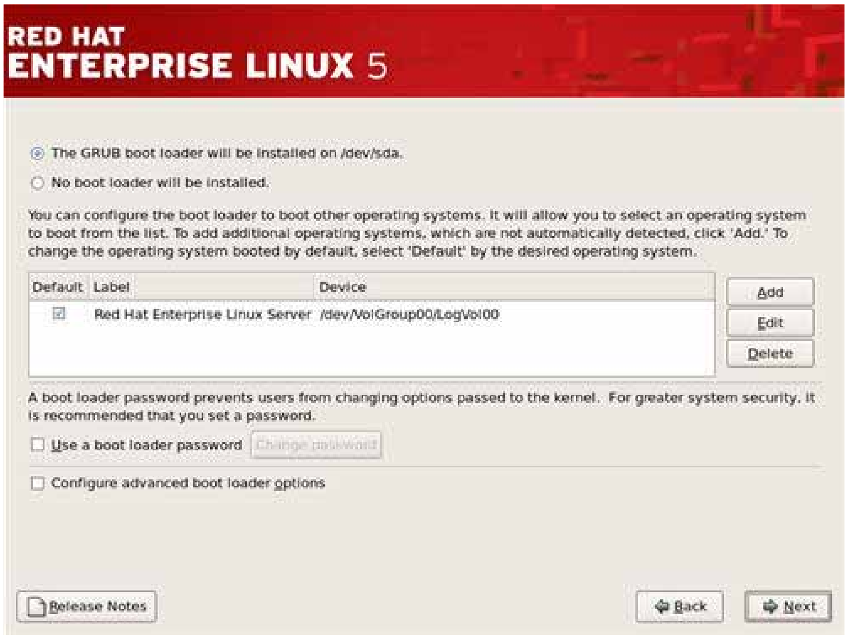
Figure C-9. Creating a Custom Layout

Step 9: If you chose one of the automatic partitioning options and selected **Review**, you can either accept the current partition settings (click **Next**), or modify the setup using **Disk Druid**, the manual partitioning tool.

If you chose to create a custom layout, you must tell the installation program where to install Red Hat Enterprise Linux. This is done by defining mount points for one or more partitions in which Red Hat Enterprise Linux is installed. You may also need to create and/or delete partitions at this time (see *Figure C-9 on page C-7*).

Click **Next.**

C.2.10 Step 10



● The GRUB boot loader will be installed on /dev/sda.

○ No boot loader will be installed.

You can configure the boot loader to boot other operating systems. It will allow you to select an operating system to boot from the list. To add additional operating systems, which are not automatically detected, click 'Add.' To change the operating system booted by default, select 'Default' by the desired operating system.

Default	Label	Device
☑	Red Hat Enterprise Linux Server	/dev/VolGroup00/LogVol00

A boot loader password prevents users from changing options passed to the kernel. For greater system security, it is recommended that you set a password.

☐ Use a boot loader password

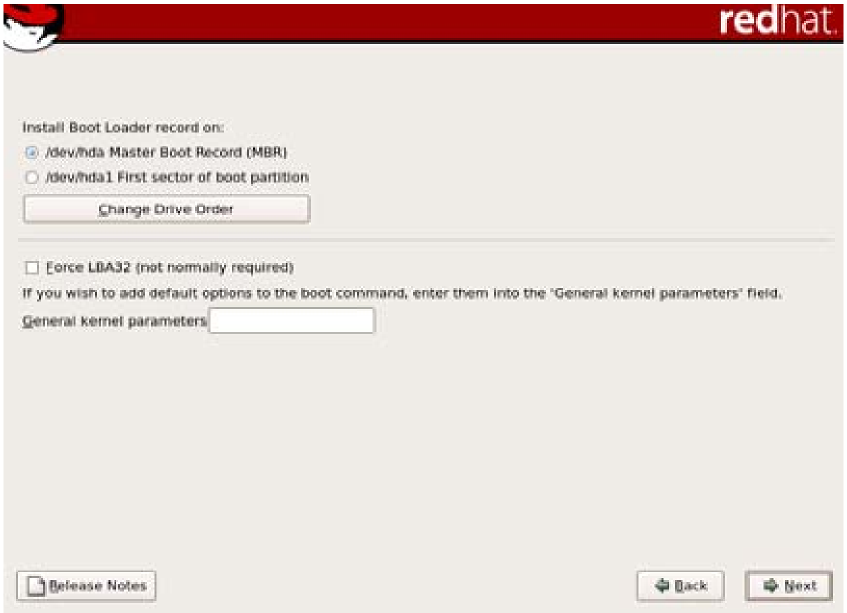
☐ Configure advanced boot loader options

Figure C-10. Setting Up Boot Loader

Step 10: Once you have configured your partitions, set up a boot loader. If you select “No Boot Loader will be Installed,” you’ll need to use a third-party boot loader such as Partition Magic or Microsoft’s TLDR. If you want to set up a Boot Loader Password, or to configure more advanced boot loader options, select the appropriate check box. (see *Figure C-10 on page C-8*).

To configure more advanced boot loader options, such as changing the drive order or passing options to the kernel, be sure **Configure advanced boot loader options** is selected before clicking **Next**.

C.2.11 Step 11



Install Boot Loader record on:

● /dev/hda Master Boot Record (MBR)

○ /dev/hda1 First sector of boot partition

☐ Force LBA32 (not normally required)

If you wish to add default options to the boot command, enter them into the 'General kernel parameters' field.

General kernel parameters

Figure C-11. Master Boot Record (MBR)

Step 11: Now that you have chosen which boot loader to install, you can also determine where you want the boot loader to be installed. You may install the boot loader in one of two places:

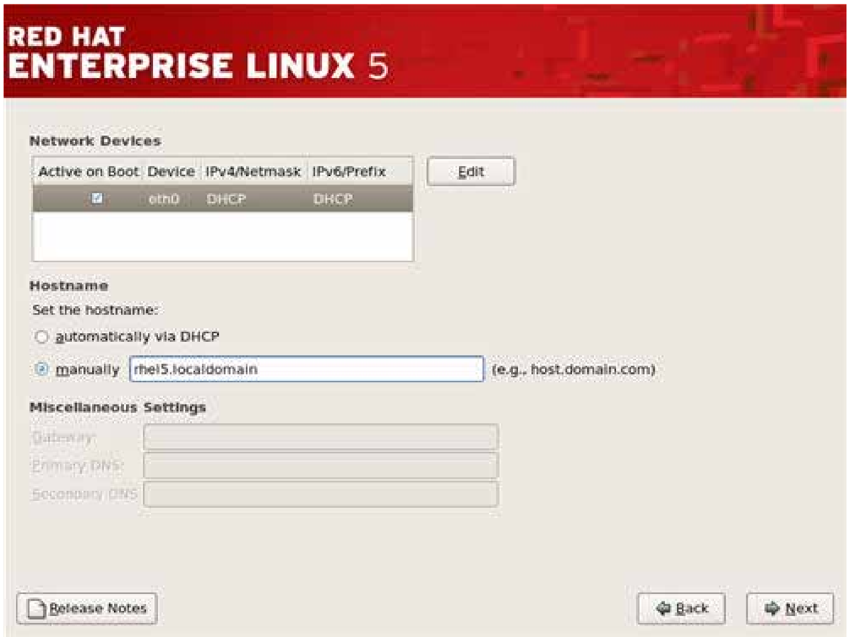
- The master boot record (MBR) — This is the recommended place to install a boot loader, unless the MBR already starts another operating system loader, such as System Commander.

The MBR is a special area on your hard drive that is automatically loaded by your computer's BIOS, and is the earliest point at which the boot loader can take control of the boot process. If you install it in the MBR, when your machine boots, GRUB presents a boot prompt. You can then boot Red Hat Enterprise Linux or any other operating system that you have configured the boot loader to boot (see *Figure C-11 on page C-9*).

- **The first sector of your boot partition** — This is recommended if you are already using another boot loader on your system. In this case, your other boot loader takes control first. You can then configure that boot loader to start GRUB, which then boots Red Hat Enterprise Linux. If your system only uses Red Hat Enterprise Linux, you should choose the MBR.

Click the **Change Drive Order** button if you would like to rearrange the drive order or if your BIOS does not return the correct drive order. Changing the drive order may be useful if you have multiple SCSI adapters, or both SCSI and IDE adapters, and you want to boot from the SCSI device. Click **Next**.

C.2.12 Step 12



Network Devices

Active on Boot	Device	IPv4/Netmask	IPv6/Prefix
☑	eth0	DHCP	DHCP

Hostname

Set the hostname:

○ automatically via DHCP

● manually rhel5.localdomain (e.g., host.domain.com)

Miscellaneous Settings

Gateway:

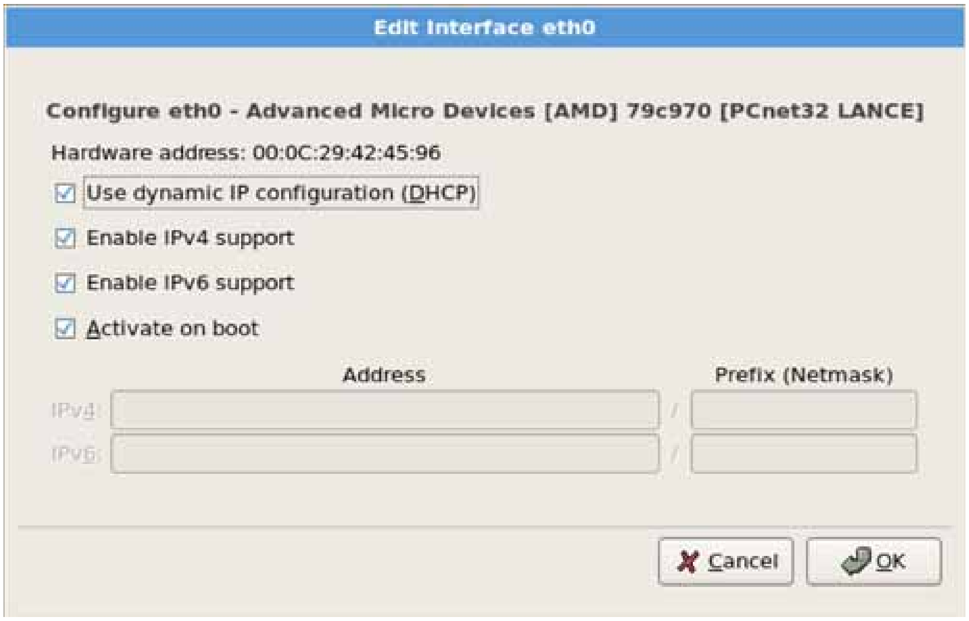
Primary DNS:

Secondary DNS:

Figure C-12. Network Devices List

Step 12: The installation program automatically detects any network devices you have and displays them in the **Network Devices** list (see *Figure C-12 on page C-10*). Once you have selected a network device, click **Edit**.

C.2.13 Step 13



Edit Interface eth0

Configure eth0 - Advanced Micro Devices [AMD] 79c970 [PCnet32 LANCE]

Hardware address: 00:0C:29:42:45:96

☑ Use dynamic IP configuration (DHCP)

☑ Enable IPv4 support

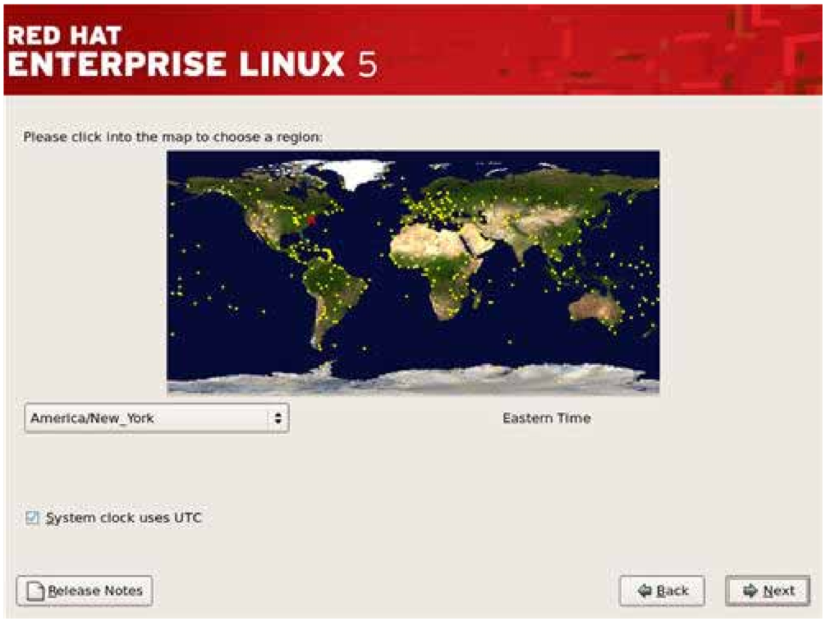
☑ Enable IPv6 support

☑ Activate on boot

Figure C-13. Edit Interface Pop-Up Screen

Step 13: From the **Edit Interface** pop-up screen, you can choose to configure the IP address and Netmask (for IPv4 - Prefix for IPv6) of the device via DHCP (or manually if DHCP is not selected) and you can choose to activate the device at boot time. If you select **Activate on boot**, your network interface is started when you boot (see *Figure C-13 on page C-11*). If you do not have DHCP client access or you are unsure what to provide here, please contact your network administrator. Click **OK.**

C.2.14 Step 14



Please click into the map to choose a region:

America/New_York

Eastern Time

☑ System clock uses UTC

Figure C-14. Selecting Time Zone

Step 14: Set your time zone by selecting the city closest to your computer's physical location. Click on the map to zoom in to a particular geographical region of the world (see *Figure C-14 on page C-12*).

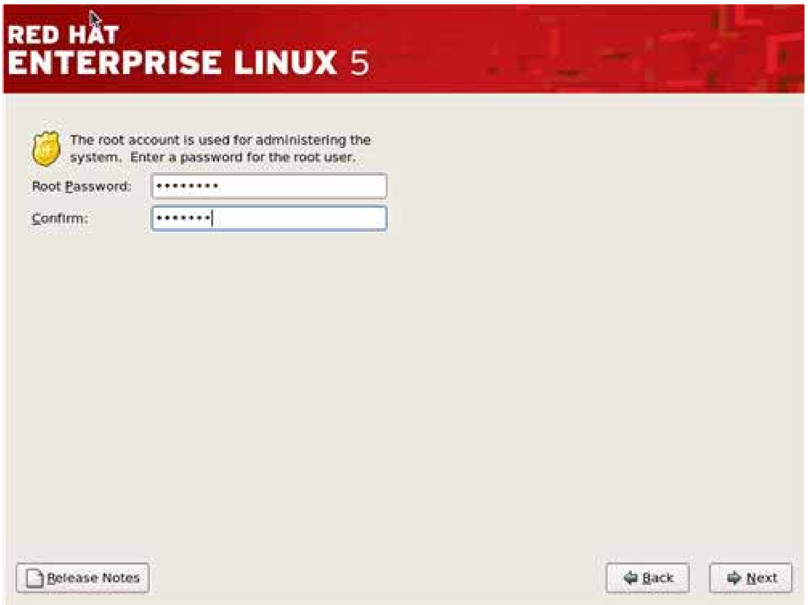
From here there are two ways for you to select your time zone:

- Using your mouse, click on the interactive map to select a specific city (represented by a yellow dot). A red **X** appears indicating your selection.

- You can also scroll through the list at the bottom of the screen to select your time zone. Using your mouse, click on a location to highlight your selection.

Click **Next**.

C.2.15 Step 15



The root account is used for administering the system. Enter a password for the root user.

Root Password: ••••••••

Confirm: •••••••

Figure C-15. Setting Up Root Account and Password

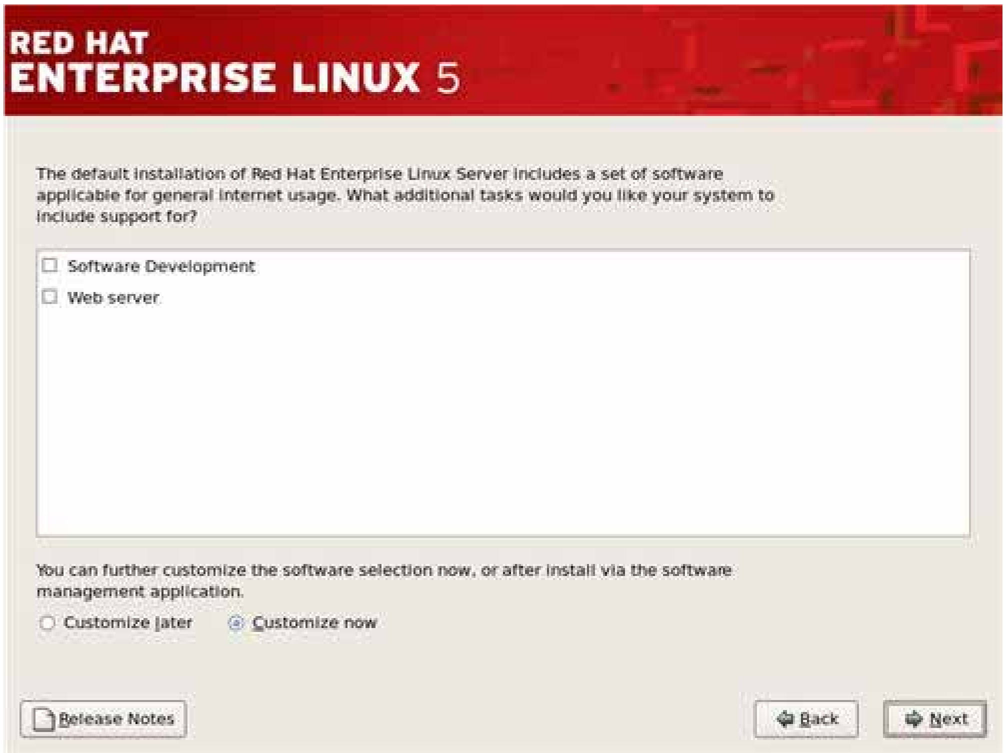
Step 15: Setting up a root account and password is one of the most important steps during your installation.

Your root account is similar to the administrator account used on Windows NT machines. The root account is used to install packages, upgrade RPMs, and perform most system maintenance.

Logging in as root gives you complete control over your system (see *Figure C-15 on page C-13*).

Click **Next**.

C.2.16 Step 16



The default installation of Red Hat Enterprise Linux Server includes a set of software applicable for general Internet usage. What additional tasks would you like your system to include support for?

☐ Software Development
☐ Web server

You can further customize the software selection now, or after install via the software management application.

○ Customize later ● Customize now

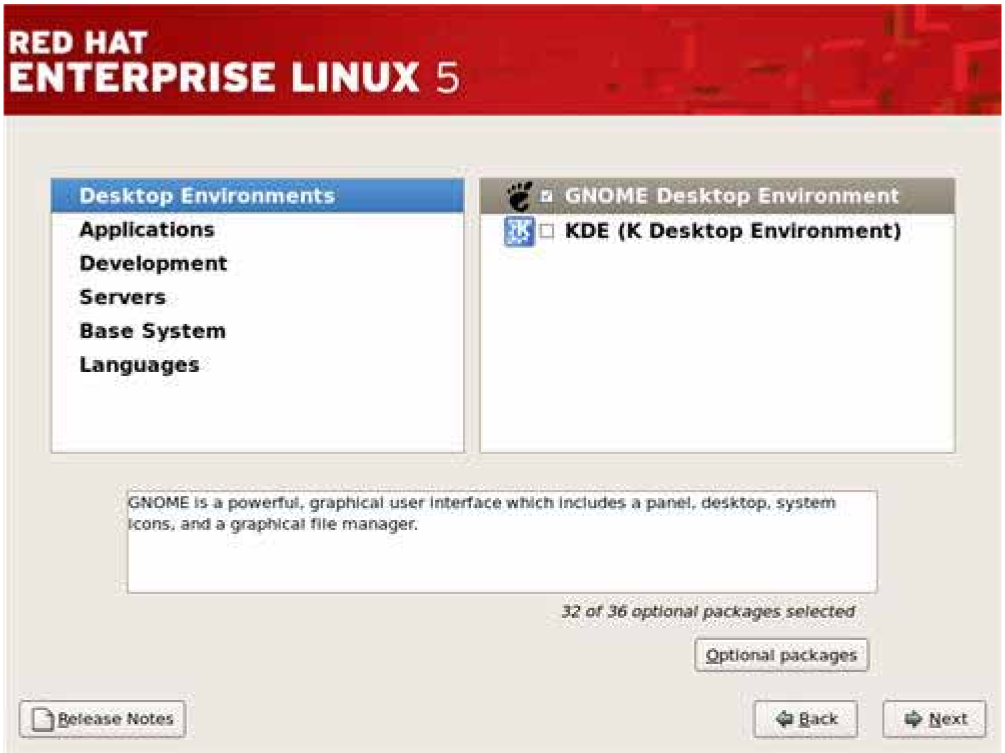
Figure C-16. Package Installation Default Screen

Step 16: Now that you have made most of the choices for your installation, you are ready to confirm the default package selection or customize packages for your system.

The **Package Installation Defaults** screen appears and details the default package set for your Red Hat Enterprise Linux installation. This screen varies depending on the version of Red Hat Enterprise Linux you are installing (see *Figure C-16 on page C-14*).

To customize your package set further, select the **Customize now** option on the screen. Clicking **Next** takes you to the **Package Group Selection** screen.

C.2.17 Step 17


RED HAT
ENTERPRISE LINUX 5
Desktop Environments
Applications
Development
Servers
Base System
Languages
☑ GNOME Desktop Environment
☐ KDE (K Desktop Environment)
Optional packages
Release Notes
Back
Next

GNOME is a powerful, graphical user interface which includes a panel, desktop, system icons, and a graphical file manager.

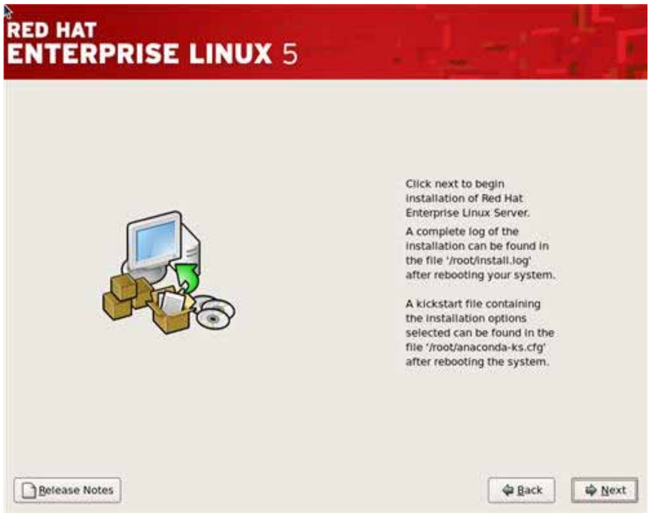
32 of 36 optional packages selected

Figure C-17. Optional Packages

Step 17: You can select package groups, which group components together according to function (for example, **X Window System** and **Editors**), individual packages, or a combination of the two. To select a component, click on the checkbox beside it. Select each component you wish to install.

Once a package group has been selected, if optional components are available you can click on **Optional packages** to view which packages are installed by default, and to add or remove optional packages from that group (see *Figure C-17 on page C-15*). If there are no optional components this button will be disabled. Click **Next**.

C.2.18 Step 18



Click next to begin installation of Red Hat Enterprise Linux Server.

A complete log of the installation can be found in the file '/root/install.log' after rebooting your system.

A kickstart file containing the installation options selected can be found in the file '/root/anaconda-ks.cfg' after rebooting the system.

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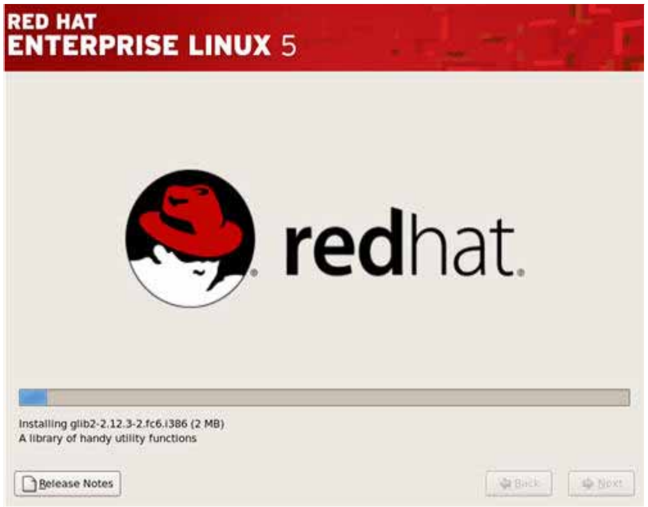
Release Notes
Back
Next

Figure C-18. Option to Review or Continue

Step 18: Once you have selected the package groups of your choice, you get one last chance to go back before starting the installation process. Click Next if you're happy with your choices, or click Back to make changes (see *Figure C-18 on page C-16*). Click **Next**.

C.2.19 Step 19



Installing glib2-2.12.3-2.fc6.i386 (2 MB)
A library of handy utility functions

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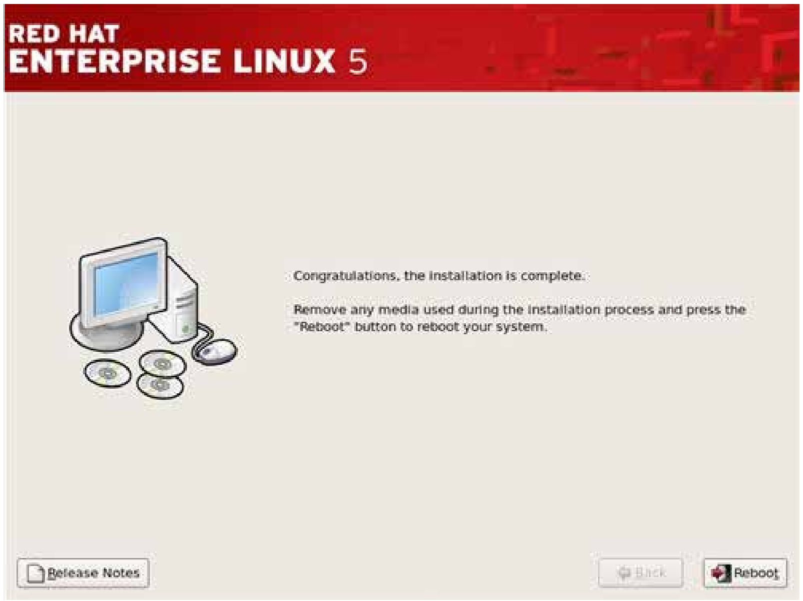
ENTERPRISE LINUX 5
redhat.
Release Notes
Back
Next

Figure C-19. Installation Begins

Step 19: Installation Starts (see *Figure C-19 on page C-16*).

C.2.20 Step 20



Congratulations, the installation is complete.

Remove any media used during the installation process and press the "Reboot" button to reboot your system.

Figure C-20. Installation is Complete

Step 20: Congratulations! Your Red Hat Enterprise Linux installation is now complete! The installation program prompts you to prepare your system for reboot. Remember to remove any installation media if it is not ejected automatically upon reboot (see *Figure C-20 on page C-17*)

After your computer's normal power-up sequence has completed, the graphical boot loader prompt appears at which you can do any of the following things:

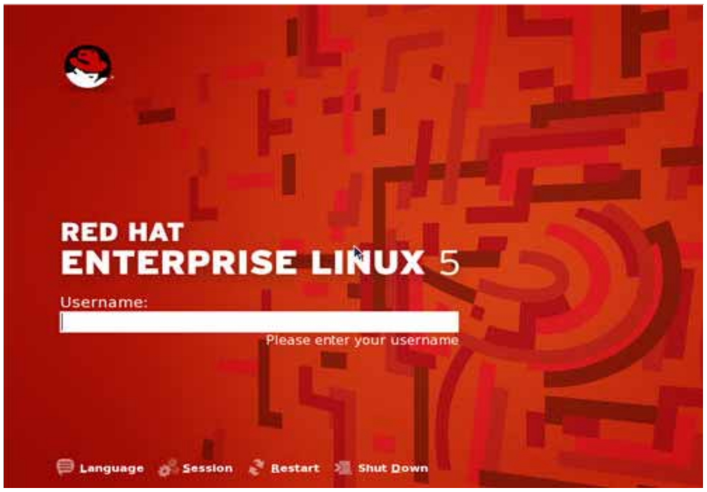
- Press Enter — causes the default boot entry to be booted.

- Select a boot label, followed by Enter — causes the boot loader to boot the operating system corresponding to the boot label.

- Do nothing — after the boot loader's time-out period, (by default, five seconds) the boot loader automatically boots the default boot entry.

Do whatever is appropriate to boot Red Hat Enterprise Linux. One or more screens of messages should scroll by.

C.2.21 .Step 21


RED HAT
ENTERPRISE LINUX 5
Username:
Language
Session
Restart
Shut Down

Please enter your username

Figure C-21. Login Screen

Step 21: Eventually, a `login:` prompt or a GUI login screen appears (if you installed the X Window System and chose to start X automatically). (see *Figure C-21 on page C-18*).

C.2.22 Step 22

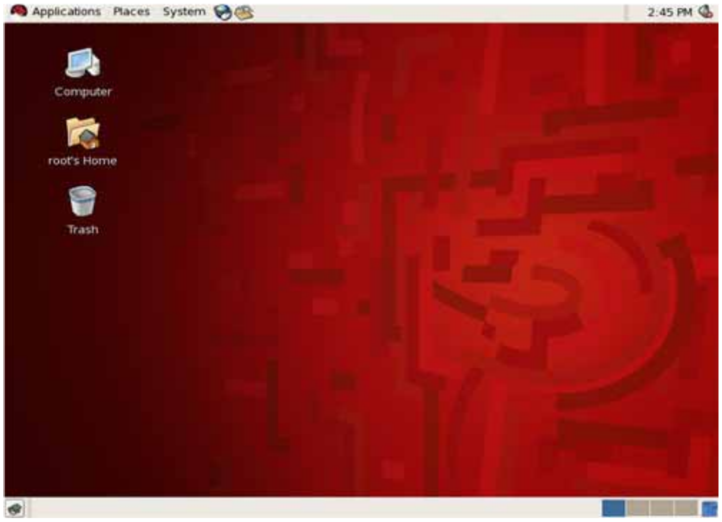

Applications
Places
System
2:45 PM
Computer
root's Home
Trash

Figure C-22. Ready to use the Desktop

Step 22: Once logged in, you are ready to use the desktop (see *Figure C-22 on page C-18*).

Appendix D

Optional Remote On/Off Switch

D.1 Remote On/Off Configuration

Customers interested in installing an *optional* switch from which to remotely turn the RES-12XR3-S for X8DTL-6/-6F **on** or **off** are able to order a Remote On/Off Switch module that is easily installed in an available storage-drive bay (see *Figure D-1*, which shows the Remote On/Off Switch installed in an RES-32XR3/FIO system).

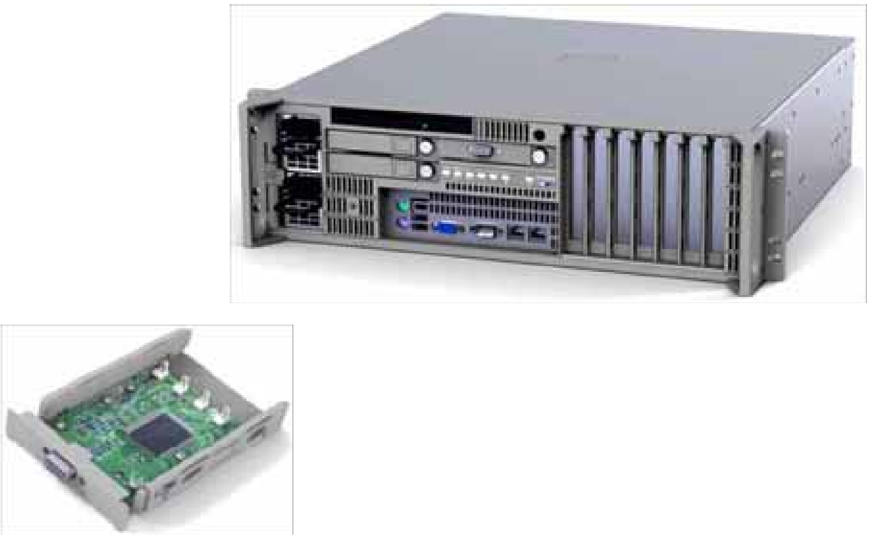


Figure D-1. Remote On/Off Switch Module

The Remote On/Off Switch module is installed after first removing one of the existing RES-12XR3-S for X8DTL-6/-6F storage drives (any except the boot drive), then installing a cable with a standard male DB9 connector at one end and an On/Off switch (an LED is *optional*) at the other end.

When operational, if the RES-12XR3-S for X8DTL-6/-6F is turned **OFF**, pressing the remote switch ON will turn the system on.

If the RES-12XR3-S for X8DTL-6/-6F is turned **ON**, pressing the switch OFF for less than 4 seconds will gracefully shut down the system through the BIOS; pressing the switch OFF for 4 seconds or more results in a “hard” power off (equivalent to pulling the plug” on the system).

D.2 Remote On-Only Configuration

When the Remote On/Off Switch module is configured as an ON-only device, if the RES-12XR3-S for X8DTL-6/-6F is turned **OFF**, pressing the remote switch ON will turn the system on. Turning the RES system off, however, requires pressing the ON/OFF button that is located directly on the front of the RES-12XR3-S for X8DTL-6/-6F chassis.

D.3 Ordering the Remote On/Off Switch

Because internal modifications must be made to the RES-12XR3-S for X8DTL-6/-6F in order to support the Remote On/Off Switch module, the module must be ordered and installed at the time your system is ordered.

Appendix E

Re-Packing Instructions

E.1 Re-Packaging for Shipment

If it becomes necessary to return equipment to Themis Computer, it is very important that the equipment be shipped in packaging that provides adequate protection against crushing and moisture invasion. The original packaging is best for this purpose, provided the packaging is retained in serviceable condition. If the original packaging is no longer serviceable, or no longer available, care should be taken in repackaging for shipment so that the equipment is protected from damage in transit. Equipment should be wrapped in a moisture resistant covering and placed either in double boxes, or in boxes with crush resistant insulation between the equipment and the outer walls of the container. If using the original packaging, the clear plastic membrane should be placed next to the equipment, i.e. up against the bottom, or down against the top.

The following instructions assume the original packing components are still available, and in serviceable condition.

E.2 Packing Components

The original packing components are shown in **Figure E-1.** (page E-2). They comprise a packing box, bottom crush-resistant layer, and top crush-resistant layer. The bottom and top crush-resistant layers are identical components, placed so that the side with the plastic membrane is against the equipment.

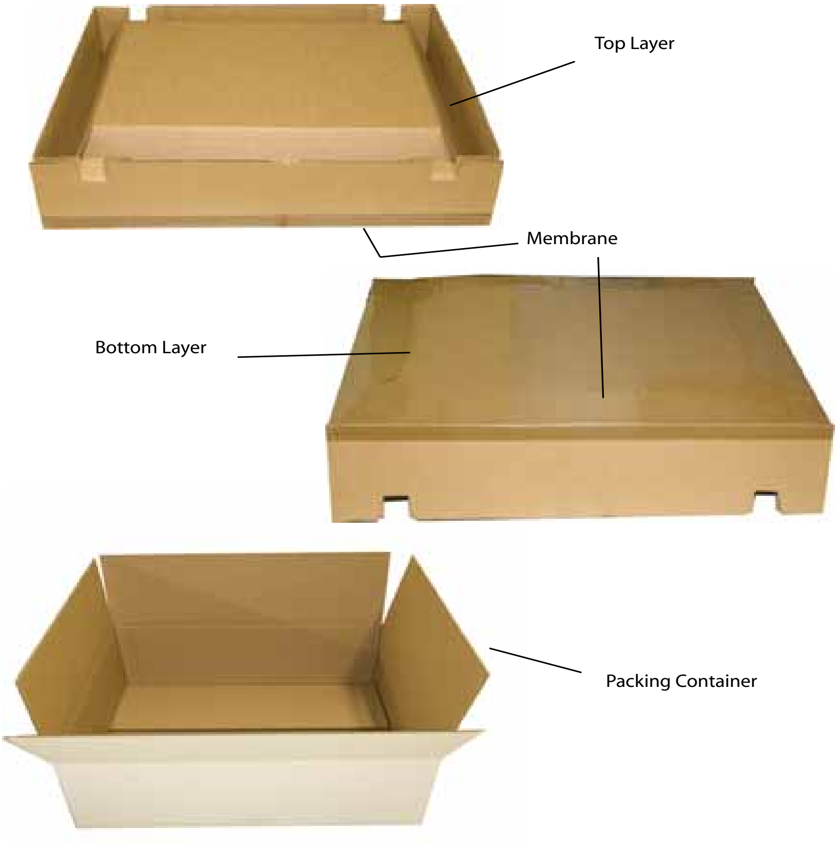


Figure E-1. Packaging Components

E.3 Instructions for Re-Packing

Re-assemble the packing material about the equipment in accordance with the following instructions: (See **Figure E-2.** (page E-3))

- Inspect the original packing materials for serviceability.
- Place one crush-resistant layer open side down, membrane side up, in the bottom of the box.
- Place the equipment on top of the bottom layer, right side up.

- Place the other crush-resistant layer, membrane side down, open side up, on top of the equipment.
- Press down on the top layer to firmly compress the layers around the equipment, and allow for the box flaps to be closed.
- Seal the top of the box with strong packing tape, wrapping the tape completely around the box, both lengthwise, and crosswise.
- Prepare for shipment in accordance with the instructions received from Themis Computer.

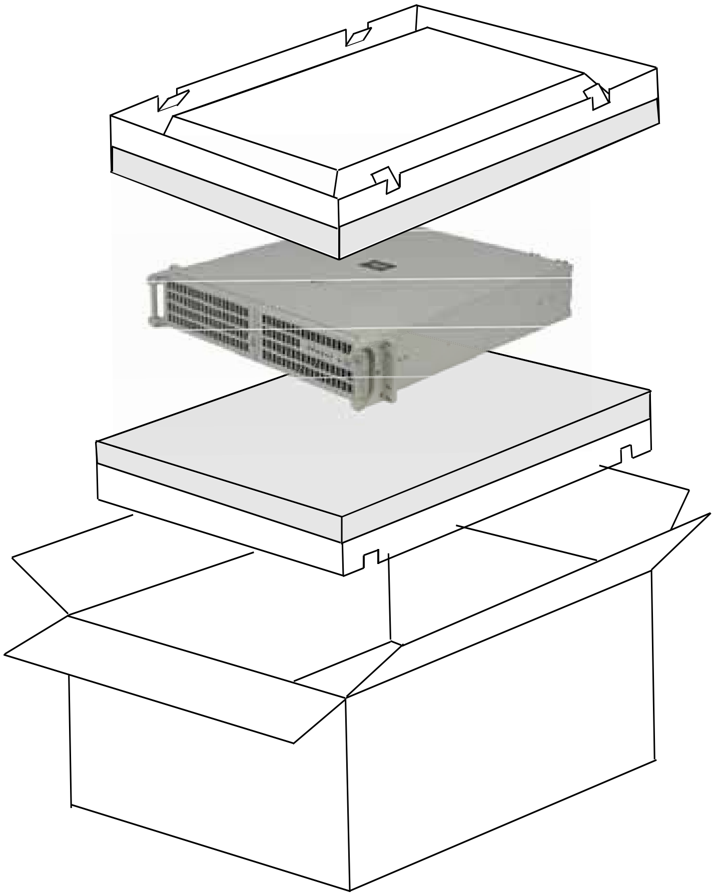


Figure E-2. Order of Assembly

Index

Numerics

19” rack *xx*
2RU form-factor *1-2*
38-mm-fan housing *2-1*

A

AC
  LED *2-18*
  power cord *1-19*, *1-20*, *2-17*
  power LED *2-19*
  power socket *2-17*
  power supply *1-4*
accessory kit *1-19*
antistatic bags *2-1*
antistatic wrist strap *2-1*
applications
  military/aerospace *1-1*
  telecommunications *1-1*

C

Cautions *xxi*
CD-RW/DVD-ROM drive *1-2*
COM1 / COM2 serial port/header *1-9*
Comments *xxi*
components, major *1-4*
Configuration, system *2-18*
CPU *1-1*

D

Dimensions, chassis *1-2*
disk drives
  installation *2-11*
  removal *2-10*
DVI connector *2-18*

E

ECC SDRAM
  memory modules *2-5*
Electrical Specifications *1-15*
Electrostatic Discharge *1-16*
EMI *xx*
Environmental Specifications *1-16*
ESD
  grounding techniques *2-1*
  protected mat *2-1*
Ethernet *A-4*
Expansion slots *1-2*

F

flanges *2-16*
form-factor, 2RU *1-2*
front bezel *2-9*
front doors *2-9*
front panel *1-4*
fused AC *1-16*

G

General Specifications *1-14*
Gigabit Ethernet *A-4*
graphics card *2-18*

H

hard-disk drives, unlocking *2-10*

I

I/O Connectors
  Ethernet LAN Port *1-9*
  PS/2 keyboard *1-9*
  PS/2 mouse *1-9*
  Serial Ports *1-9*
  USB Serial Ports *1-9*
I/O connectors *1-5*
I/O faceplates *1-4*
ICH1OR + IOH-24D *xxi*

Installation procedures *2-1*
  installing rack-mount slides *B-1*
  memory modules *2-5*
Instructions for Re-Packing *E-2*
Intel 5500 (Tylersburg) chipset *xxi*
Intel Xeon CPU, 1366-pin *1-1*

K

keys, front bezel *1-19*

L

LAN port *A-4*
latch locks *1-4*
LEDs *1-5*
  NIC (Gb Ethernet) *1-8*
  SAS/SATA storage drives (SD) *1-8*
  system *1-4*
Linux Installation *2-18*
lithium battery *2-1*
  installation *2-9*
  lithium battery and socket, illustration of *2-8*, *2-9*
  removal *2-8*

M

Main BIOS Setup Screen *3-5*
Major Components of the RES-12XR3-S *1-6*
Major Features Table
  Chipset *1-2*
  Memory *1-2*
  Peripheral Support *1-2*
  Processors *1-2*
memory modules, ECC SDRAM *2-5*
Memory Population for 2CPUs Installed *2-4*
Memory Population for One CPU (CPU1) Installed *2-3*
Memory Population for One CPU (CPU2) Installed *2-3*

N

Noise *1-16*
Noise baffle *1-16*
Noise muffler *1-16*
noise reduction *1-16*
noise specification *1-16*
Notes *xxi*

O

Opening the RES-12XR3-S Front Doors *2-9*
Operating temperature *1-2*
Optional Remote On/Off Switch *D-1*
Ordering the Remote On/Off Switch *D-2*
Output Voltage *1-16*
Overheat LED *1-8*

P

Packaging and Shipping *1-19*
Packing Components *E-1*
PCI cards *2-1*, *2-8*
pinouts
  Gigabit Ethernet LAN *A-4*
  serial ports *A-2*
  USB port *A-2*
Plugging in and Securing the AC Power Cords *2-17*
power
  button *1-4*
  button and LED *2-18*
  cord sockets *1-4*
  LED *2-19*
power cords *2-17*
power supply *1-2*, *2-1*, *2-18*
  installation *2-16*
  locking mechanism *2-15*
power-cord retainer bracket *1-19*
protective cover, chassis *2-1*
PS/2 keyboard *A-1*
PS/2 mouse *A-1*

R

rack-mount brackets *1-2*, *2-16*
rack-mount slides *xx*, *1-2*, *1-20*, *B-1*
  installation kit *B-2*
  screw locations *B-1*

rack-mount slides (optional) *2-17*
rear panel *1-4*
Rear-Panel I/O *1-2*
Red Hat Enterprise Linux *C-1*
Remote On/Off Configuration *D-1*
Remote On-Only Configuration *D-2*
Re-Packaging for Shipment *E-1*
Re-Packing Instructions *E-1*
RES Series Models
  Approximate Weights *1-21*
RES-12XR3-S *1-1*
RES-12XR3-S General Specifications *1-14*
RES-12XR3-S Major Features *1-2*
reset switch *1-4*
RES-x2XR3 17" Manual Matrix (AC and DC Power Supplies) *xix*
RES-x2XR3 20" Manual Matrix (AC and DC Power Supplies) *xviii*
RES-x2XR3/FIO 16” Chassis Manual Matrix (AC and DC Power Supplies) *xx*

S

Safety Instructions *iv*
  Electrostatic Discharge (ESD) *v*
  Instructions for the Lithium Battery *vi*
  Operation of Laser Source Devices *v*
screw locations for rack-mount slides *B-1*
serial ports *A-2*
Shock *1-16*
shock *xx*
Shock endurance *1-2*
Sidebars *xxi*
slides, rack-mount *xx*
slimline drive *1-2*
Sound Baffle Installed
  front *1-17*
  rear *1-18*
Specifications
  Altitude *1-15*
  BTU Rating *1-15*
  Dimensions *1-14*
  Electrostatic Discharge *1-16*
  Input Current *1-15*
  Input Frequency *1-15*
  Input Leakage *1-15*
  Input Power *1-15*
  Input VA Rating *1-15*
  Input Voltage *1-15*
  Maximum Wet Bulb *1-15*
  Noise *1-16*
  Packaging and Shipping *1-19*
  Plug Type *1-15*
  Power Factor *1-15*
  Relative Humidity *1-14*
  Shock *1-16*
  Temperature *1-14*
  Weight *1-14*
storage drives *2-1*
Super I/O *1-13*
system LEDs *1-4*
  NIC (Gb Ethernet) *1-8*
  Overheat *1-8*
  Power *1-8*
  Power Fail LED *1-8*
  SAS/SATA storage drives SD) *1-8*
System Power *1-16*

T

Technical Support *1-19*
temperature *xx*
Turning the System Off *2-19*
Turning the System On *2-17*

U

USB ports *A-2*
USB Serial Ports *1-9*

V

VGA connector *2-18*
VGA Connector-Pin Signals *A-3*
VGA graphics port *A-3*

W

Warnings *xxi*

Website Information *xxi*

X

X8DTL-6F Motherboard Block Diagram *1-3*
Xeon processors *1-1*

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